2009 Annual Report
Boulder County Cooperative Mosquito Control Program
Town of Superior

October 2009

Colorado Mosquito Control, Inc.

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On The Cover:

“Rain, rain and more rain” – The summer of 2009 will be remembered as one of the wettest on record, and with heavy rain comes heavy mosquito populations.

A cool and very wet June...June was the wettest month of the summer with a total of 4.86 inches reported at DIA. Much higher numbers were reported in other localized areas. This was the second wettest June since record keeping began in 1872. The normal June precipitation in June for Denver is 1.45 inches.

Fortunately cool temperatures slow larval mosquito development and aid in control efforts. The average temperature of 64.4 degrees was 3.2 degrees below normal for the month. This was the first June since 2003 with no 90 degree days. This fact, along with higher than normal Culex mosquito populations led to speculation that 2009 had the potential for an outbreak of West Nile virus which fortunately did not develop.

Besides being cool and wet; June was an active weather month as well with nearly double the normal number of days with thunderstorms (18 vs. 10 normally). 15 days with measurable precipitation; normal is 9 days and 6 days with dense fog, normal is less than one. Additionally, the normal percent sunshine for June is 70 percent; June 2009 was 51%

Colorado Mosquito Control, Inc.

BOULDER COUNTY COOPERATIVE MOSQUITO CONTROL PROGRAM TOWN OF SUPERIOR ANNUAL REPORT 2009

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THE BOULDER COUNTY COOPERATIVE MOSQUITO MANAGEMENT PROGRAM MISSION STATEMENT

The Town of Superior Mosquito Management Program completed its Boulder County Cooperative year of cost effective Integrated Mosquito Management operations in 2009. Many communities across Colorado recognize the need to control mosquito annoyance and the risk of mosquito-borne disease associated with flood irrigation practices, urban development, and snowmelt runoff. Integrated mosquito management operations that utilize environmentally-sensitive controls and new technologies can greatly enhance the outdoor experience without negatively impacting the environment.

The primary objective of the Boulder County Cooperative Mosquito Management Program is to employ trained field biologists to suppress populations of larval mosquitoes in aquatic habitats. CMC technicians utilize bacterial larvicides that reduce mosquito populations without harming non-target organisms. Additionally, monitoring of adult mosquito populations is an essential component of an Integrated Mosquito Management (IMM) program. Surveillance trapping performed in Boulder County Cooperative provides data used to assess West Nile Virus Infection Rates, as well as the need for adult mosquito control measures. Data driven response with mosquito adulticide ULV technology can reduce the threat of disease transmission and annoyance associated with mosquitoes, while reducing the necessity for large amounts of products to be applied.

CMC OBJECTIVES

The Town of Superior Mosquito Management Program, operated by CMC, has developed into one of the foremost environmentally sensitive and technologically advanced integrated mosquito management programs in the United States. Additionally, CMC has fostered cooperative efforts for mosquito control and epizootic response between surrounding municipalities and Homeowners Associations, The Centers for Disease Control (CDC) Vector-Borne Disease unit in Fort Collins, The Colorado Division of Wildlife, local County Open Space Departments, The Colorado Department of Health and Environment (CDPHE), and Colorado State University (CSU) to respond to West Nile Virus risk. Data obtained from CMC is utilized by these entities when evaluating the disease risks associated with spikes in mosquito abundance. This public-private data-sharing partnership in the interest of public health is unrivaled elsewhere in the country.

CONTRACTOR COMMITMENT

Colorado Mosquito Control, Inc. (CMC) is a large-scale contractor specializing in complete integrated mosquito control services. CMC utilizes an aggressive preemptive Integrated Pest Management (IPM) approach to controlling mosquito populations within contracted areas. CMC was established in 1986, is the largest private company specializing in mosquito control in Colorado, and is the only company in Colorado offering complete IPM mosquito control services.

CMC currently has programs across the state of Colorado including: Homeowners Associations, Incorporated Towns, Cities and Counties, and Indian Reservations. Geographically, CMC reaches from the Ute Mountain Ute Reservation in the southwest corner of the state to Fort Morgan in northeastern Colorado. CMC has programs in several mountain areas including the Gunnison Valley, the I-70 corridor through Garfield County, and parts of the upper Colorado River valley.

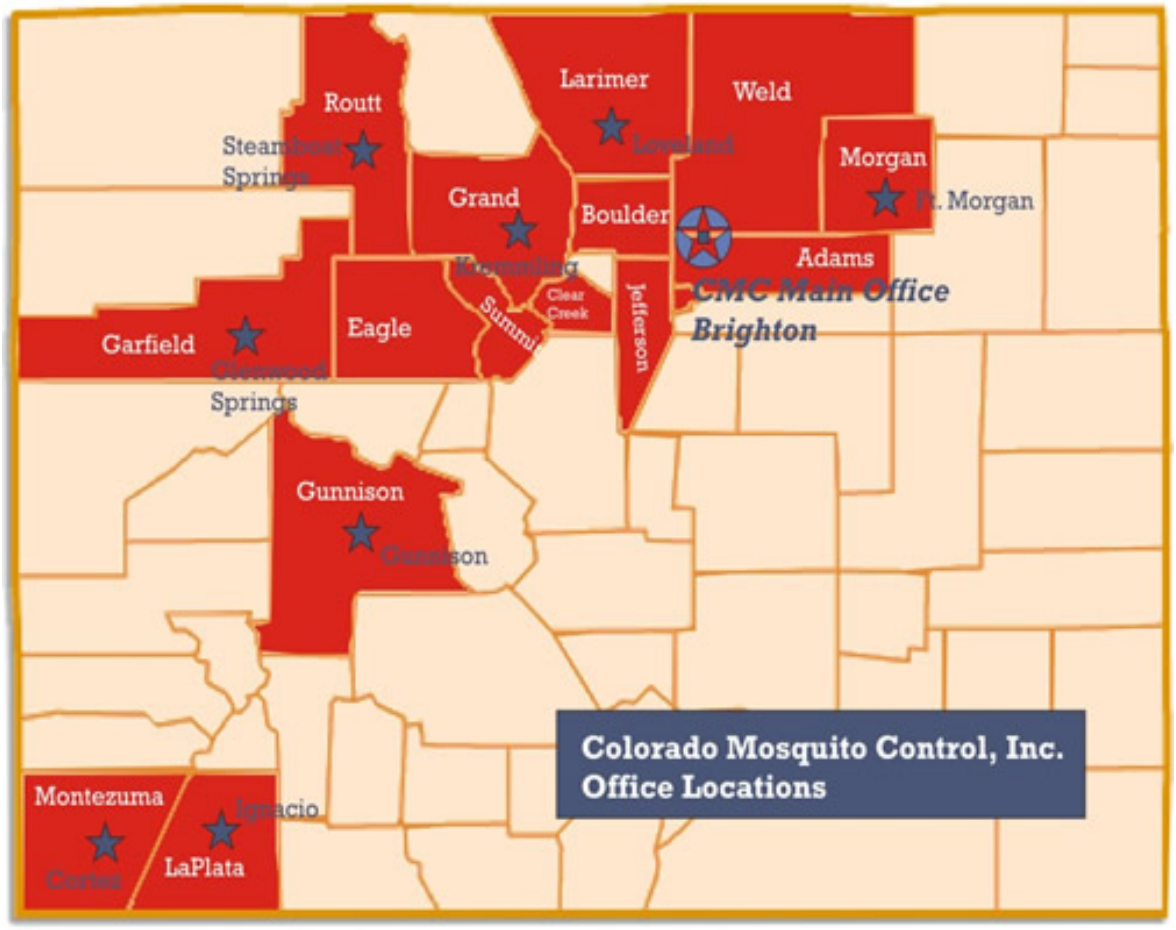
With 8 years of experience monitoring West Nile Virus in Colorado, it is clear that limiting exposure to mosquito bites is the best way to reduce the risk of disease. A well-developed mosquito management operation is only part of the picture, and CMC also emphasizes the need for personal action and protection through our educational outreach programs. *Culex tarsalis*, our primary WNV vector in the state, is more abundant today than in the past, due to current land use practices. CMC is committed to providing top quality service, via education outreach and data driven management, in an effort to minimize West Nile Virus risk and reduce mosquito annoyance in the communities where we operate and also live.

Colorado Mosquito Control, Inc. as the contractor for the Boulder County Cooperative Mosquito Control Program uses demonstrated scientific integrated pest management (IPM) methods of survey, inspection, diagnosis, biological/biochemical controls, natural enemies and limited low-toxicity pesticide applications to professionally accomplish desired control results. All of the methods and materials used have been sanctioned and registered by the U.S. EPA, Centers for Disease Control, the Colorado Department of Agriculture and the American Mosquito Control Association.

Cooperating Entities

As one of many Front Range communities dealing with West Nile Virus (WNV) on an annual basis, our understanding of WNV has grown significantly since its arrival in the area during 2002. Our residents, native and migratory birds, and local vector mosquitoes face the annual risk of becoming infected with this disease that is now considered to be endemic – West Nile Virus is here to stay. However, the severity of the disease varies from season to season, in large part due to the variable weather patterns of the Colorado Front Range.

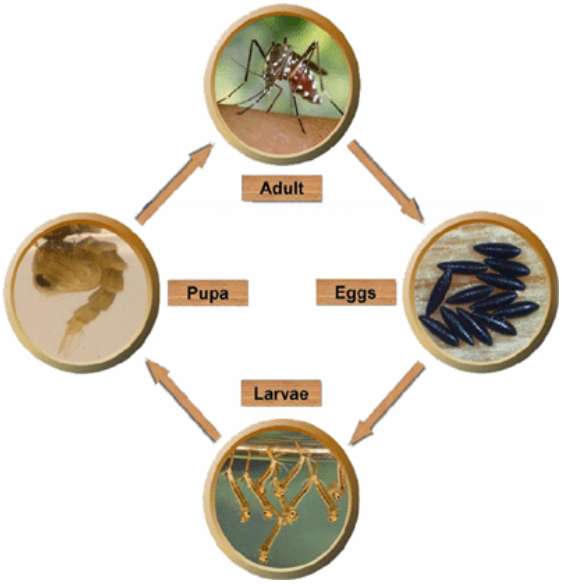
CMC operates in many cities and counties along the Front Range. In doing so, we are on the frontline when developing best management practices specifically tailored to the conditions found in these Colorado communities. The experience obtained by CMC, municipal officials, county health departments and operational divisions monitoring West Nile Virus have laid the foundation for emergency response plans. This knowledge base, derived through cooperative data sharing, has put in place the tools needed to manage potential future mosquito-borne disease outbreaks.



2009 SEASON PERSPECTIVE

The higher-than-normal levels of precipitation during the 2009 season replenished the water table to levels not seen in years for many areas along the Front Range. Rainfall totals remained above average for a majority of the 2009 mosquito season. Although most of the rainfall occurred in early April and June, additional weekly rainfall created numerous larval mosquito habitats and kept things green throughout the season.

With the excess moisture came a corresponding above-average workload for larval mosquito control activities, due to the flushing and refilling of aquatic habitats on a regular basis. In general, many reservoirs and ditches remained full for a large portion of the summer, because irrigation water was not moved as quickly. Many grassy edges and inlets to reservoirs were consistently producing mosquito larvae throughout most of the season. Working with local farmers to understand and recognize the patterns of agricultural irrigation continues to be one of CMC's ongoing priorities.



Mosquito populations in the first part of the 2009 season consisted of primarily *Aedes spp.*, known as "floodwater" mosquitoes as their eggs hatch in response to rising water levels resulting from rainfall and/or irrigation. Adult *Culex* mosquito populations spiked in mid-July, as they require standing water to lay their eggs in. Overall, vector mosquitoes comprised about 50-75% of mosquito collections during July and August, remaining in line with historical averages. This scenario could have played out much differently had the median temperature during early spring been warmer, as occurred in 2003 when the vector *Culex* mosquitoes had an early population spike. 2009 was different in that we had similar moisture levels, but without the corresponding high temperatures of the 2003 "WNV epidemic" season.

The first West Nile Virus infected mosquitoes were detected in Weld County on July 10, Boulder County on July 13, and Larimer County on July 14. West Nile infection rates in mosquitoes remained below epidemic years and the Colorado Department of Health and Environment (CDPHE) ceased WN testing of mosquitoes on August 14. Dip counts for larval mosquitoes slowed into late August. By the first days of September the species composition of *Culex* mosquitoes collected from adult trapping dropped to less than 10% of the total counts in most areas.

West Nile Virus 2009

Background

West Nile Virus was first identified in Uganda in 1937. Since that time, activity has been documented throughout Africa, Europe, West and Central Asia, and areas of the Middle East. The virus made its first appearance to North America in 1999 when it was documented in New York City. WNV comes from a family of viruses known as Flaviviridae and is closely related to other encephalitis-causing viruses that can have severe effects on both humans and animals, including Western Equine Encephalitis and St. Louis encephalitis in our region.

WNV has a wide range of symptoms which can range from mild flu-like symptoms to death. Of humans affected, nearly 80% will show no symptoms at all. The majority of people who do show symptoms will usually suffer from high fevers, muscle soreness, and overall fatigue. However, approximately 1% of people will develop much more severe symptoms including meningitis (inflammation of the linings surrounding the brain and spinal cord), encephalitis (inflammation of the brain), or very rarely poliomyelitis, which can cause paralysis in parts of the body.

Since the introduction of WNV to the United States in New York City in 1999, the virus has made a complete westward expansion to the West Coast. Starting in the Northeastern parts of the United States, the virus steadily spread through the South, the Midwest, the Rocky Mountain region, and more recently the Western States. Although many states have shown decreased case counts since epidemic years, the Colorado Front Range presents the ideal combination of abundant habitat and weather conditions during some years for *Culex tarsalis* mosquitoes to amplify West Nile Virus.

Past Years

Colorado first saw activity of the virus late in the summer of 2002. In 2003, Colorado was the hardest hit state, recording 2,947 human cases and 63 deaths, most of which occurred along the Front Range. In 2004, the majority of the cases shifted to the Western Slope and the state totaled 291 cases with 4 deaths occurring in Mesa County. In 2005, WNV activity was spread throughout the state of Colorado with no particular clustering in any one region. In 2006, early season hot and dry conditions kept initial adult mosquito populations low, but rainfall in early August caused resurgence in the *Culex* mosquito densities. WNV infection in mosquitoes presented the greatest risk in the months of August and September, as hundreds of positive-tested mosquito pools and over 269 human WNV cases were recorded along the northern Front Range. Seven deaths occurred in 2006 across Colorado. Early season warm and wet weather conditions in 2007 were perfect for the rapid development of *Culex tarsalis* mosquitoes and ramping of West Nile Virus during May and June. Also, early positive mosquito sample pool tests indicated potential trouble from the onset in 2007. The first three positive mosquito sample pools collected from Larimer County mosquito surveillance traps were obtained earlier than normal that season on June 19. Weld County mosquito surveillance traps detected WNV-positive sample pools on July 6 and Boulder County had its first WNV mosquito sample pool on July 9. The 2007 season was the second most active season for

West Nile Virus cases in Colorado, second only to the 2003 epidemic year. In 2008 Culex mosquito densities remained low, as did the amount of West Nile Virus activity across the State. Colorado reported 71 human cases with 1 death. Of the total cases with clinical diagnoses, 13 cases occurred in Larimer County, 19 cases were reported in Weld County, and 13 cases were reported from Boulder County in 2008.

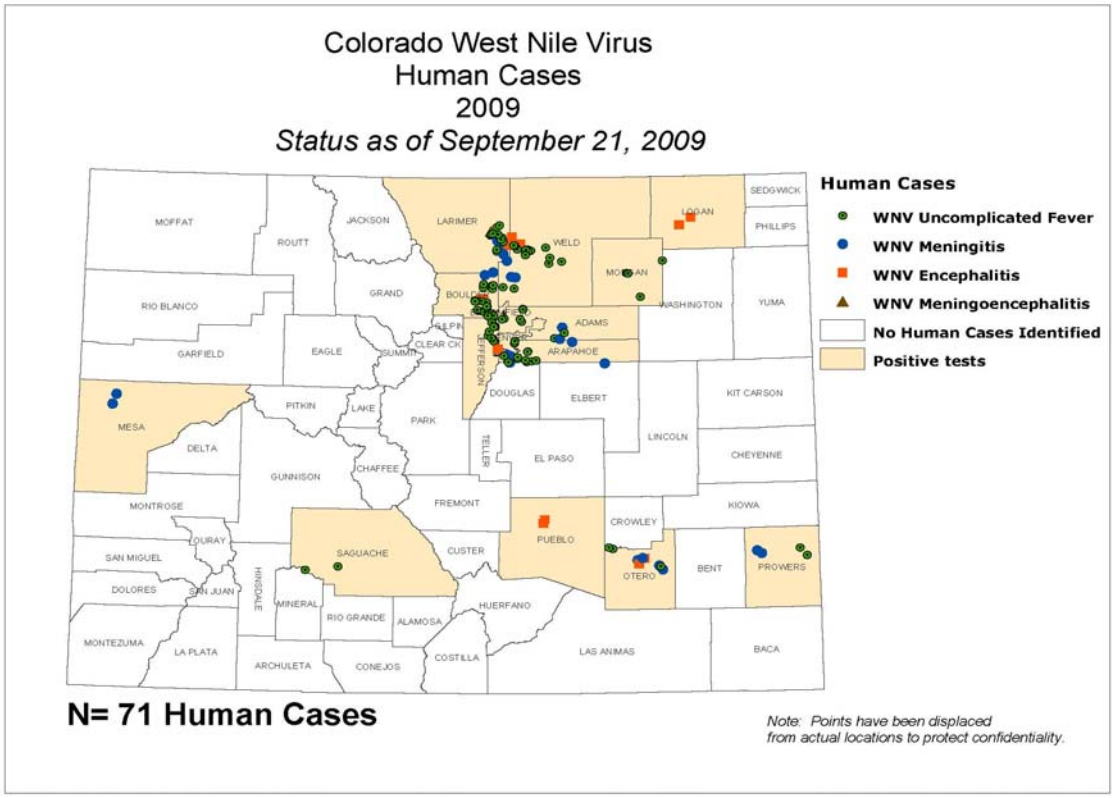
Colorado Perspective

In the Northern Front Range of Colorado, much of the water diverted from the mountain regions is used for flood irrigation of pastures, crops, and our own residential yards. Fluctuation in water levels greater than one-half inch can result in floodwater mosquito larvae hatching in fields, cattail marshes, riparian areas and grasses. These sites typically do not drain quickly, dependent on levels of the ground water table, thereby causing multiple generations of *Culex* mosquito larva to result as the water remains.

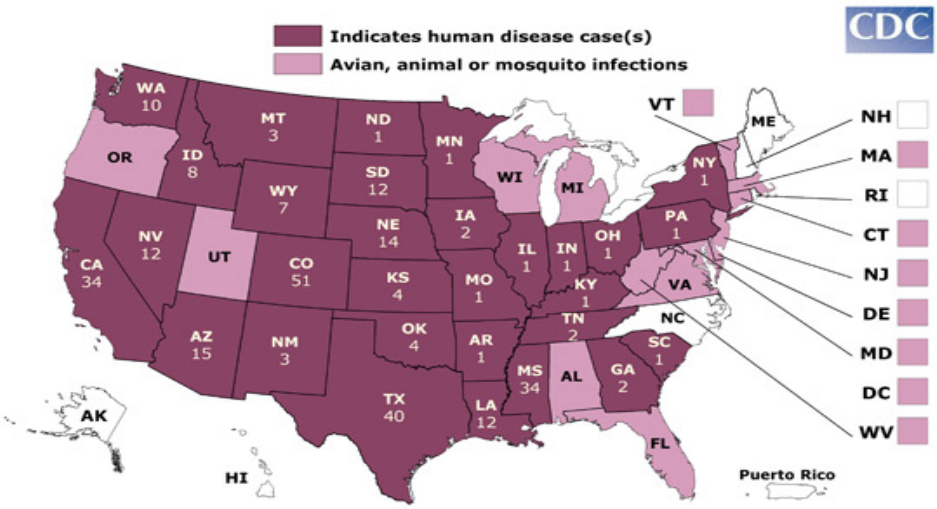
Human WNV Infections- Clinical Diagnosis for Colorado 2009
As listed on the CDPHE website-Updated September 21, 2009

County of Residence	New Cases	Fever	Meningitis	Encephalitis	Total cases	Total deaths
Adams		4	1		5	1
Arapahoe	1	6	3	.	9	.
Boulder	1	10	.	1	11	.
Broomfield	.	1	.	.	1	.
Denver	1	1	.	.	1	.
Jefferson	1	6	.	1	7	.
Larimer	1	8	4	2	14	.
Logan	.	.	.	1	1	.
Mesa	1	.	1	.	1	.
Morgan	.	2	.	.	2	.
Otero	1	3	2	1	6	.
Prowers	1	1	1	.	2	.
Pueblo	.	.	.	1	1	.
Weld	.	7	1	2	10	.
COLORADO	**8**	**49**	**13**	**9**	**71**	**1**

Larimer, Boulder and Weld counties typically report the greatest number of human West Nile Virus infections in the state when compared to other counties. This trend is likely due to a combination of the topography for drainage, intermingled with the greatest proportion of the state's population residing along the Front Range. Exposure to *Culex tarsalis* mosquitoes along the Front Range increases as residents enjoy summertime BBQ's and the numerous recreational activities our state has to offer. Given the amount of vector mosquitoes in our area and WNV risk, it becomes increasingly important that residents apply mosquito repellents each time they venture outdoors during the mosquito season.



2009 West Nile Virus Activity in the United States (Reported to CDC as of September 22, 2009)



Larval Mosquito Control Activities

Since over 95% of CMC's operations are targeted toward larval mosquito control, approximately that same percentage is applied in infrastructure to facilitate those operations. CMC's warehouse, material handling equipment, supply chain, data input, vehicle fleet, and application equipment are all designed to support our management services that emphasizes larval control.

Every technician is assigned a CMC-owned fleet vehicle, fully equipped with necessary larval surveillance tools, larval control applicators, and biological larvicide products. Each vehicle contains informational brochures about mosquito repellents, recommended methods for reducing backyard mosquitoes, and the "Fight the Bite" campaign literature for residential distribution. Technicians also have on hand reference sheets about larvicide control products and mission objectives for contracted communities used in public education programs. Every vehicle contains Material Safety Data Sheets (MSDS) in accordance with Colorado Department of Agriculture requirements.

CMC management spends the winter months editing field notes and property ownership information, as well as historical inspection records for use in establishing inspection priority during the upcoming season. Early activities each season also involve review and revision of GIS maps from the previous season. Old sites often need updating, and new sites are constantly added to the inspection program in response to new construction and development.

Hiring of seasonal technicians began in February. CMC received an abundance of qualified applicants this season, many of whom had experience in aquatic sampling or an understanding of biological sciences. This aided in improving the quality of public education and outreach that CMC was able to provide.

CMC field technicians began ground inspections for new sites and inspection of existing sites in early April within contracted areas. CMC's Annual Field Technician Classroom Training Day took place on May 18, with over 80 new and returning field technicians in attendance. Daily field training by CMC management and veteran employees was performed during the week of May 19, and routine field inspections were in full swing from May 25 through August 28. Larval inspections were completed by early September largely due to cool daily temperatures during this time, causing natural mortality in

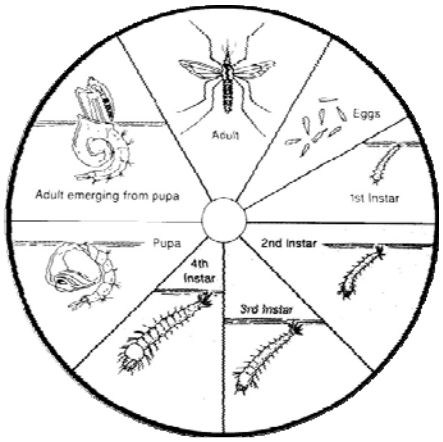
adult mosquitoes. Superior saw a total of 785 site inspections in 2009 of which 665 or 85% were wet. Of those, 104 sites, or 16%, were subsequently treated for mosquito breeding for a total of 42.7 acres treated. See *Appendix: Larvicide Data Summary.* For comparisons dating to 2005 please see *Appendix: Larval Site Inspections by Service Area, Larval Site Treatments by Service Area and Larval Acreage Treated by Service Area.*

LARVAL MOSQUITO CONTROL OPERATIONS

Practical experience and scientific research have shown that the most effective way to control mosquito populations is through an aggressive Integrated Pest Management (IPM) approach. IPM aims at using a variety of concepts, tools, and products to reduce a pest population to tolerable levels. Translating these ideas to mosquito control, CMC has found the most environmentally and economically-sound approach is through targeting the aquatic larval stage of the mosquito. Targeting this stage prevents the emergence of the adult mosquito and thus, reduces disease transmission and nuisance.

Larval mosquito control can be achieved in several ways, including biological, biochemical, chemical, and mechanical means. Although there are a variety of methods for reducing larval populations, some options may have greater consequences than benefit. Mechanical or habitat modification is a technique which may be used, but the area to be modified and the extent to which the work will affect the surrounding area must be carefully assessed. Permanent ecological damage may occur if extensive habitat change has taken place. True biological controls may also have non-target affects that outweigh the benefits of their control capacity. The biological control agent, if not carefully selected and evaluated, may cause and imbalance in the natural ecological community, as well as threaten population levels of other organisms. This was the case with the introduced mosquito fish, no longer widely utilized in Colorado as they readily preyed upon young amphibians and other fish species in addition to controlling mosquitoes.

CMC's favored method of larval mosquito control is through bacterial bio-rational products. The main product used by CMC is a variety of bacteria (*Bacillus thuringiensis var. israeliensis*). *Bti,* as it is known, has become the cornerstone of most mosquito control programs throughout the world. Almost all Mosquito Abatement Districts have incorporated *Bti* applications into their management practices, given the specificity of these products on larval mosquitoes causing almost no mortality among other non-target organisms. The benefits of applications using *Bti* include its efficacy and lack of environmental impacts, as well as its cost efficiency. When used properly, successful mosquito control without impact to aquatic invertebrates, birds, mammals, fish, amphibians, reptiles, or humans can be achieved. A broad label allows for the use of the product in the majority of the habitats throughout the service area. Another bacterial product closely related to *Bti* is *Bacillus sphaericus (Bs)*. In addition to all of the benefits of *Bti*, *Bs* is by definition a true biological control agent in that it remains in the system through multiple broods, or generations, of mosquitoes. Unfortunately, the residual benefit of the control comes at a cost in price at approximately three times that of *Bti*.



Other larval control products include a growth regulator (methoprene), a mineral oil, and an organophosphate (Abate). Methoprene is a synthetic copy of a juvenile growth hormone found in larval mosquitoes. The hormone prevents normal development of the adult mosquito in the pupal stage, eventually causing death. While a good control product, the cost is prohibitive to be the predominant product in a large scale program. The benefits of these products are the availability of 30 and 150 day formulations. Abate, the one chemical larval control product CMC uses, serves as an effective product, but label restrictions limit its use in many areas. CMC limits the use of chemical larvicides to areas with little biodiversity, such as gravel pits, or areas which chronically produce large amounts of mosquitoes, but only as a last resort when other solutions are not present. Mineral oil is the only product effective on the pupal stage and therefore is an essential tool when pupae are found.

All of the aforementioned methods and products represent the essential ingredients of Integrated Pest Management. Mosquitoes are very well adapted insects and can be found in many different habitat types from a cattail marsh to a cup littered on the side of the road. A variety of tools must be used to prevent resistance and ensure the best method will be available for any given situation.

CMC Surveillance Laboratory

Data on mosquito abundance and species identity is critical in the operation of a successful mosquito management program. Over the past few years, identifying, packaging, and sending *Culex* mosquito pool samples to the CDPHE or CSU labs for West Nile Virus testing has also become critically important in the battle against West Nile Virus and other mosquito-borne diseases. The Colorado Mosquito Control Surveillance Laboratory, managed by Dr. Michael "Doc" Weissmann, has become the largest single source of adult and larval mosquito surveillance data in the state of Colorado. Specifically, CMC has 4 stereo zoom binocular microscopes, 94 CDC dry-ice baited Light Traps, 21 Reiter Gravid Traps and all associated equipment and hardware.

In 2009, Colorado Mosquito Control monitored a statewide network of over 250 trap sites, with over 3,100 trap nights set, collecting more than 499,000 adult mosquitoes that were counted and identified to species by the CMC Surveillance Laboratory. While individual traps provide only limited information, trap data is interpreted in the context of historical records for the same surveillance location, going back in time more than a decade in some locations. Individual traps are also compared to other traps from around the region that were set on the same night and therefore exposed to similar weather conditions.

Technicians working in the Surveillance Laboratory at Colorado Mosquito Control, Inc. are trained to provide accurate species identification of mosquito specimens for both adults and larval mosquitoes. More than 50 mosquito species are believed to occur in Colorado and more than 20 of those were identified from samples processed during the 2009 season from across the state, including one species found in the Pueblo area that was previously not known from Colorado.

CMC employs two kinds of traps to monitor mosquito populations. The CDC light trap uses carbon-dioxide from dry ice as bait to attract female mosquitoes that are seeking a blood meal from a respiring animal. Once attracted by the CO_2, the mosquitoes are lured by a small light to a fan that pulls them into a net for collection. The gravid trap uses a tub of highly-organic water as bait to attract female mosquitoes that are looking for a place to lay their eggs. A fan

placed close to the water surface forces mosquitoes that come to the water into a collection bag.

Additionally, the CMC Surveillance Laboratory conducts an intensive larval identification program with over 10,000 larval mosquito samples collected by field technicians. Collections are made prior to larvicide applications and identification of species and this information is recorded in our database. This information is invaluable in targeting mosquito control efforts as we gain a greater understanding of the habitat types preferred by mosquito species of Colorado and the seasonality of these habitats as sites for mosquito development.

Specimens and data collected from these traps and larval identification are used in:

- Determining effectiveness of larval control efforts. Each mosquito species prefers specific kinds of habitats for larval development. If a trap includes large numbers, it could indicate the presence of an unknown larval habitat and, based on the species identification and known habitat preference for that species, this information will direct field technicians as to possible sources of the mosquitoes collected.

- Determining larval and adult mosquito species. This helps to illustrate the threat of mosquito-borne disease amplification and transmission.

- Determining where adult control efforts were necessary. While mosquito eradication is impossible, significant population reduction is achievable. In places where larval control was insufficient, especially in neighborhoods where adult mosquitoes migrated in from larval sources outside of the control area, it may be necessary to use adulticide methods, such as ULV truck fogging or barrier sprays of nearby harborage areas. Trap counts that exceeded an acceptable threshold for an area trigger adult control measures.

- Surveillance for Mosquito-borne Disease. Historically, CMC efforts were targeted primarily at controlling mosquito nuisance problems with limited disease surveillance. However, since the arrival of the West Nile Virus in Colorado in August of 2002, the paradigm has shifted toward disease prevention and control. Accurate species identification of the mosquitoes in the traps is important when monitoring population trends. It also is necessary for evaluating whether a population spike represents an actual increase in disease transmission potential or only an increased nuisance level.

CDC Surveillance Light Trap Data Comparison

In 2009, an average of nineteen Boulder County Cooperative surveillance light trap locations monitored adult mosquito populations throughout the Boulder County Cooperative. Weather permitting, CDC battery-operated "light traps" were set weekly in each location to provide adult mosquito population data for seasonal comparisons. Surveillance trapping began June 1 and trapping was concluded on September 4, halted by cooler temperatures during the first weeks of September. For composite trap data please see *Appendix: 2009 Boulder County CDC Trap Composite Data.*

Superior's two light traps caught an average of 72 mosquitoes per week throughout the weeks it was set for a total of 2,437 mosquitoes. Of those 1,207, or 49.5 % were of the floodwater/annoyance genus *Aedes/Ochlerotatus* variety while 1,173, or 48.1 % belonged to the disease vector genus *Culex*. An average of 34 *Culex* mosquitoes was caught per trap night, the majority during July through the middle of August, historically the time of the year when *Culex* mosquitoes are most active. For additional trap information please see *Appendix: 2009 Superior CDC Trap Data Composite* as well as the respective charts for each trap.

2009 ADULT CONTROL

The goal of Colorado Mosquito Control, Inc. is to provide all residents of Boulder County Cooperative with the best options for safe, effective, modern mosquito management. The primary emphasis of the Boulder County Cooperative Mosquito Management Program is to control mosquitoes in the larval stage, using safe biological control products. This environmentally focused program maintains adulticiding applications as a final resort when mosquito populations surpass nuisance or risk thresholds. Mosquito surveillance trapping results are used to make data-driven decisions regarding areas that need to be sprayed for adult mosquito control. Adult mosquito control spraying is targeted to specific sectors determined by this trap data, thereby reducing the area sprayed and the frequency of spraying in each sector.

The Boulder County Cooperative Mosquito Control Program uses all available data from CDC light traps, gravid traps, Mosquito Hotline annoyance calls, and field technician reports to focus adult mosquito control efforts on specific, very limited "targeted" areas. In parts of the community where high numbers of mosquito annoyance calls are received, "floater" CDC light traps are set to evaluate adult population levels and species make-up. In many cases, a direct correlation is evident between areas with high complaint calls and high trap counts. While this correlation allows us to focus adult control in these areas, the emphasis is placed on finding the larval habitat sources of the trapped adults and continued larval control measures.

Colorado Mosquito Control uses state of the art technology, calibrated application timing, and least-toxic products to minimize non-target impacts. All adult mosquito control is accomplished using Ultra Low Volume (ULV) fogging equipment and performed after dusk when the majority of mosquito species are most active. This type of equipment produces droplets averaging 12 microns in diameter and allows for a minimal amount of product to be put into the environment. These treatments take place in the evening when mosquitoes are flying in greater numbers and non-target insect activity (for example, day-flying pollinators like bees) is greatly reduced. Using this application technique, the overall goal of minimal environmental impact and effective adult control is achieved in the targeted area.

CMC continued use of the water-based product AquaLuer for ULV adult mosquito control in 2009. Its' active ingredient, permethrin, is highly effective against mosquitoes, while the water-base provides a much more environmentally sound solution to oil-based adulticides. Results this year have again proven that this is the right choice for the adulticide portion of the Integrated Mosquito Management Program. Please see *Appendix: ULV Adulticide Comparison by Service Area* for more information.

As we look towards the 2010 season, we will continue to evaluate treatment areas and new control products coming to the market. As always we will listen to the goals and needs of our customers so as to continue to provide an effective program that minimizes environmental impacts.

TECHNOLOGY

CMC has strived to improve the programs offered to its customers with novel and progressive advancements, continually evaluating and implementing new products and new technologies, not only with regard to control efforts but also for data processing and information reporting. CMC shares the belief that timely information should be accessible to customers and residents, so that the people who fund the programs can access the work that is being performed. CMC also believes that the ability to access the data will improve both the resident's and municipality's ability to stay informed about West Nile Virus risk in their community.

CMC WEBSITE

Our website, www.comosquitocontrol.com, is the leading website in the State of Colorado when it comes to providing up-to-date, factual, and comprehensive information on, and links to, mosquito biology and control, mosquito-borne diseases, pesticide toxicology information, and a wealth of topics relating to mosquitoes. Our website continues to be an integral tool for dissemination of operational data to the citizens we serve, minimizing the resources and time required by the city and its employees for answering for fielding public inquiries.

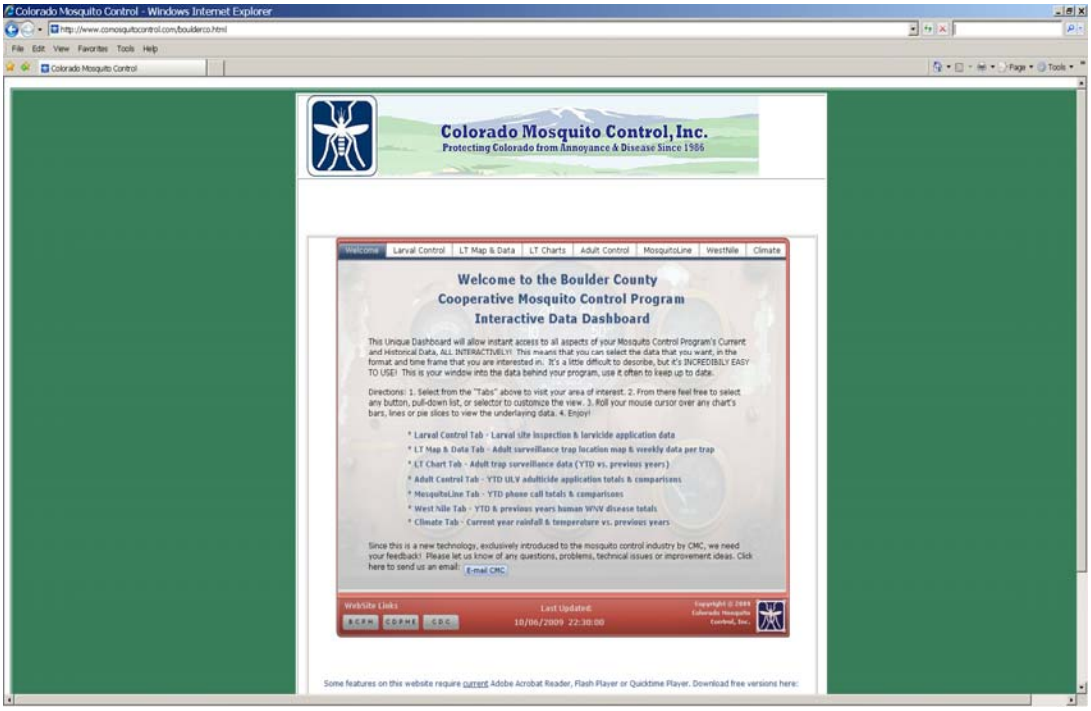
LINKS FROM WEBSITE

CMC was one of the first mosquito control organizations anywhere to publish adult mosquito control spray schedules on the web. Adult mosquito spray schedules are posted daily by 3PM.

CMC has led the industry with dissemination of data via our online dashboard. Over the past year CMC introduced a radical departure from traditional reporting methods: *Digital Interactive Reporting*. No other mosquito control company anywhere has DIGITAL INTERACTIVE REPORTING. These CMC exclusive technologies allows our customers to quickly and easily analyze thousand of data points, simply create and instantly view charts and graphs that can visually compare years of data and show trends not easily detected from traditional data analysis.

Visit the Dashboard at: http://www.comosquitocontrol.com/boulderco.html

CMC also established client website pages in 2008 and 2009 that contain program information and goals, product information, larval control areas, and annual reports in easily accessible and downloadable PDF formats.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Protecting Colorado from Annoyance & Disease Since 1986
Welcome
Larval Control
LT Map & Data
LT Charts
Adult Control
MosquitoLine
WestNile
Climate
Welcome to the Boulder County
Cooperative Mosquito Control Program
Interactive Data Dashboard
This Unique Dashboard will allow instant access to all aspects of your Mosquito Control Program's Current and Historical Data, ALL INTERACTIVELY! This means that you can select the data that you want, in the format and time frame that you are interested in. It's a little difficult to describe, but it's INCREDIBILY EASY TO USE! This is your window into the data behind your program, use it often to keep up to date.
Directions: 1. Select from the "Tabs" above to visit your area of interest. 2. From there feel free to select any button, pull-down list, or selector to customize the view. 3. Roll your mouse cursor over any chart's bars, lines or pie slices to view the underlaying data. 4. Enjoy!
* Larval Control Tab - Larval site inspection & larvicide application data
* LT Map & Data Tab - Adult surveillance trap location map & weekly data per trap
* LT Chart Tab - Adult trap surveillance data (YTD vs. previous years)
* Adult Control Tab - YTD ULV adulticide application totals & comparisons
* MosquitoLine Tab - YTD phone call totals & comparisons
* West Nile Tab - YTD & previous years human WNV disease totals
* Climate Tab - Current year rainfall & temperature vs. previous years
Since this is a new technology, exclusively introduced to the mosquito control industry by CMC, we need your feedback! Please let us know of any questions, problems, technical issues or improvement ideas. Click here to send us an email:
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Larval Control
LT Map & Data
LT Charts
Adult Control
MosquitoLine
WestNile
Climate
Boulder County Cooperative
Adult Control Program Metrics
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Longmont, City of
Louisville, City of
Superior, Town of
Select View
2009 YTD
Yearly Adulticide
Miles
Hours
Pounds of Active Ingredient
Print
WebSite Links
Last Updated:
10/06/2009 22:30:00
Some features on this website require current Adobe Acrobat Reader, Flash Player or Quicktime Player. Download free versions here:

PUBLIC OUTREACH & DATA DISSEMINATION

For 23 years, CMC has demonstrated that strong Public Outreach programs, quality Data Dissemination and outstanding Customer Service standards are the keys to success in providing large-scale municipal mosquito control programs. Citizen feedback, inquiry, and satisfaction surveys aid in evaluating the effectiveness of our program. CMC constantly looks for ways to better serve the communities we work with and appreciates the citizen involvement in improving the programs that we offer. We have clearly demonstrated this commitment by proactively incorporating numerous innovative programs, activities and services into the Boulder County Cooperative Mosquito Control Program. See *Appendix: MosquitoLine Calls by Service Area* for season summaries.

CALL NOTIFICATION & SHUTOFF SYSTEM

CMC maintains a comprehensive Call Notification & Shutoff database, and will notify residents on this list whenever ULV adulticide spray applications will be conducted within 2 blocks of their property or within the effective ULV spray drift distance (300-500 ft depending on wind speed and direction). All Shutoff locations are mapped in ArcView GIS and updated annually. Call & Shutoff forms are available online and may be submitted via the CMC website or by mail.

"PREVENTION & PROTECTION" PRESENTATIONS

CMC staff provides informative presentations about personal protection, repellents, West Nile Virus activity and ways to reduce mosquitoes by dumping/ draining standing water. Examples of groups that have benefited from these presentations include employees in the Parks & Recreation Department, Utility Workers, "at risk" employees exposed to mosquito bites from outdoor work, and senior populations within communities.

FLOATER TRAP PLACEMENT for annoyance reports at resident homes in locations away from standard trapping sites.

SUMMARY

While the summer of 2009 may well be remembered for its often record breaking rainfall the combination of heavy precipitation and cooler than average temperatures in tandem with a proactive IPM program stressing targeted breeding source treatment and new site identification, focused adult surveillance and control, as well as responsive and informed customer service, played a significant role in keeping West Nile Virus from reaching the high levels as recently seen as 2007 and overall mosquito related issues to a serviceable, comfortable minimum.

Colorado Mosquito Control wishes to thank all Town of Superior staff and council members for their continuing support and we look forward to providing Superior with mosquito control services in 2010 and beyond.

Colorado Mosquito Control, Inc.

Larvicide Data Summary

by REPORT DATE: 1/1/2009 to 9/23/2009

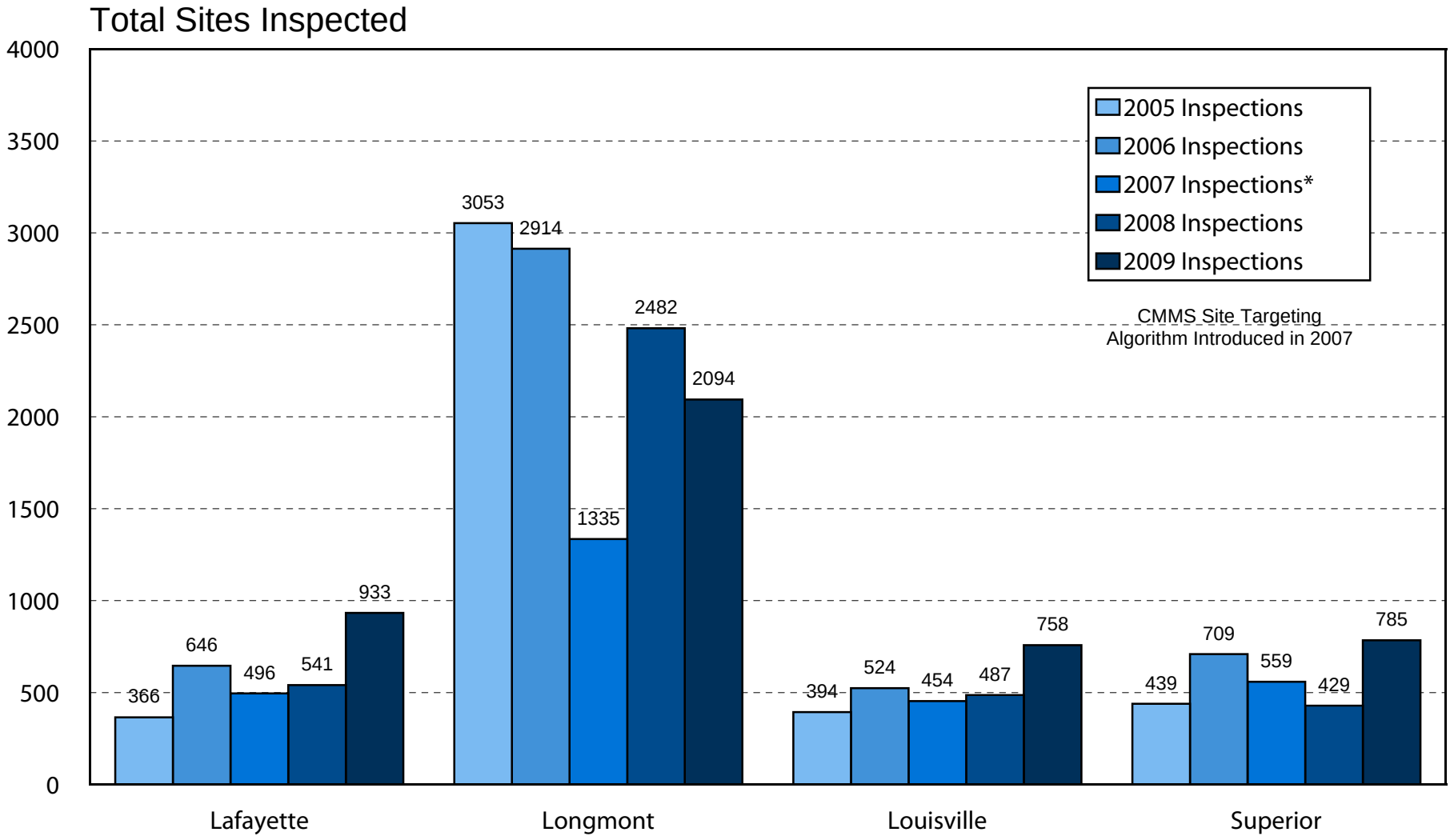
by COUNTY: Boulder

	Total Site Inspections	No. Wet Sites	Percentage Wet Sites	No Sites Treated	Percentage Breeding*	Total Acres Treated
Lafayette, City of	933	691	74 %	142	21 %	49.6
Longmont, City of	2094	1914	91 %	1117	58 %	563.5
Louisville, City of	758	584	77 %	130	22 %	42.7
Superior, Town of	785	665	85 %	104	16 %	38.9

** (Sites Treated/Wet Sites)*

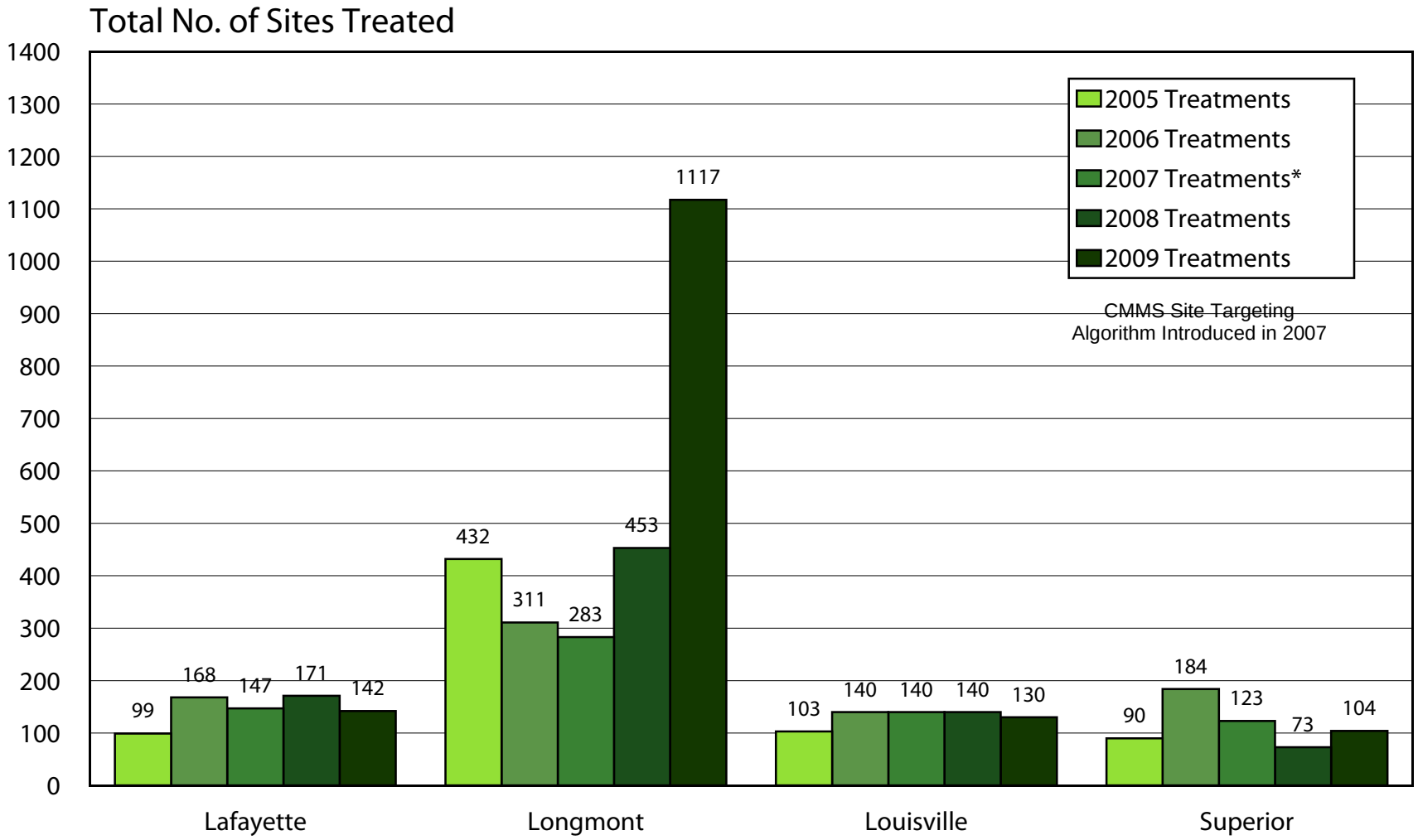
Larval Site Inspections by Service Area

'05 vs. '09 Boulder County Mosquito Control Programs



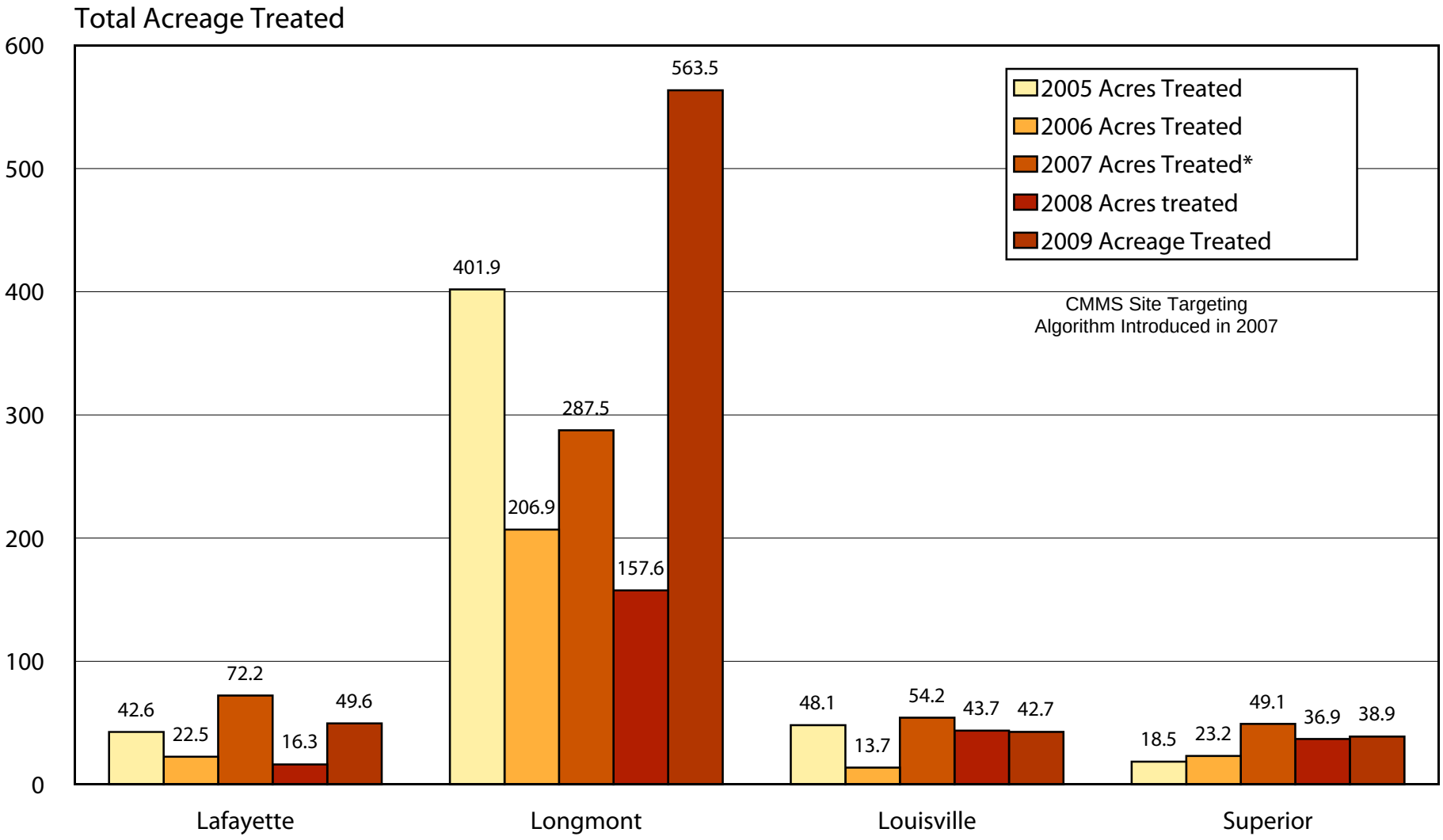
Larval Site Treatments by Service Area

'05 - '09 Boulder County Mosquito Control Programs



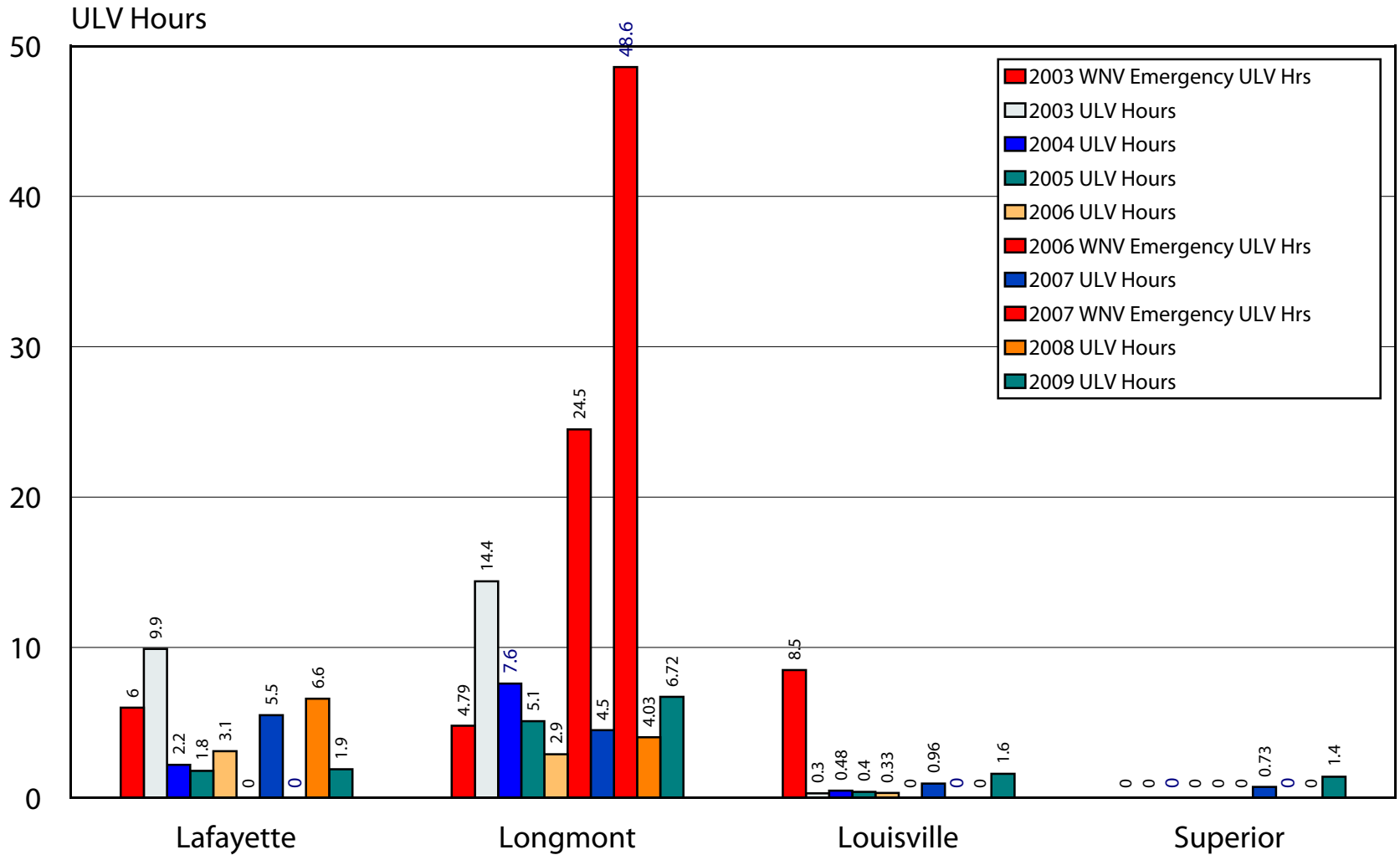
Larval Acreage Treated by Service Area

'05-'09 Boulder County Mosquito Control Programs



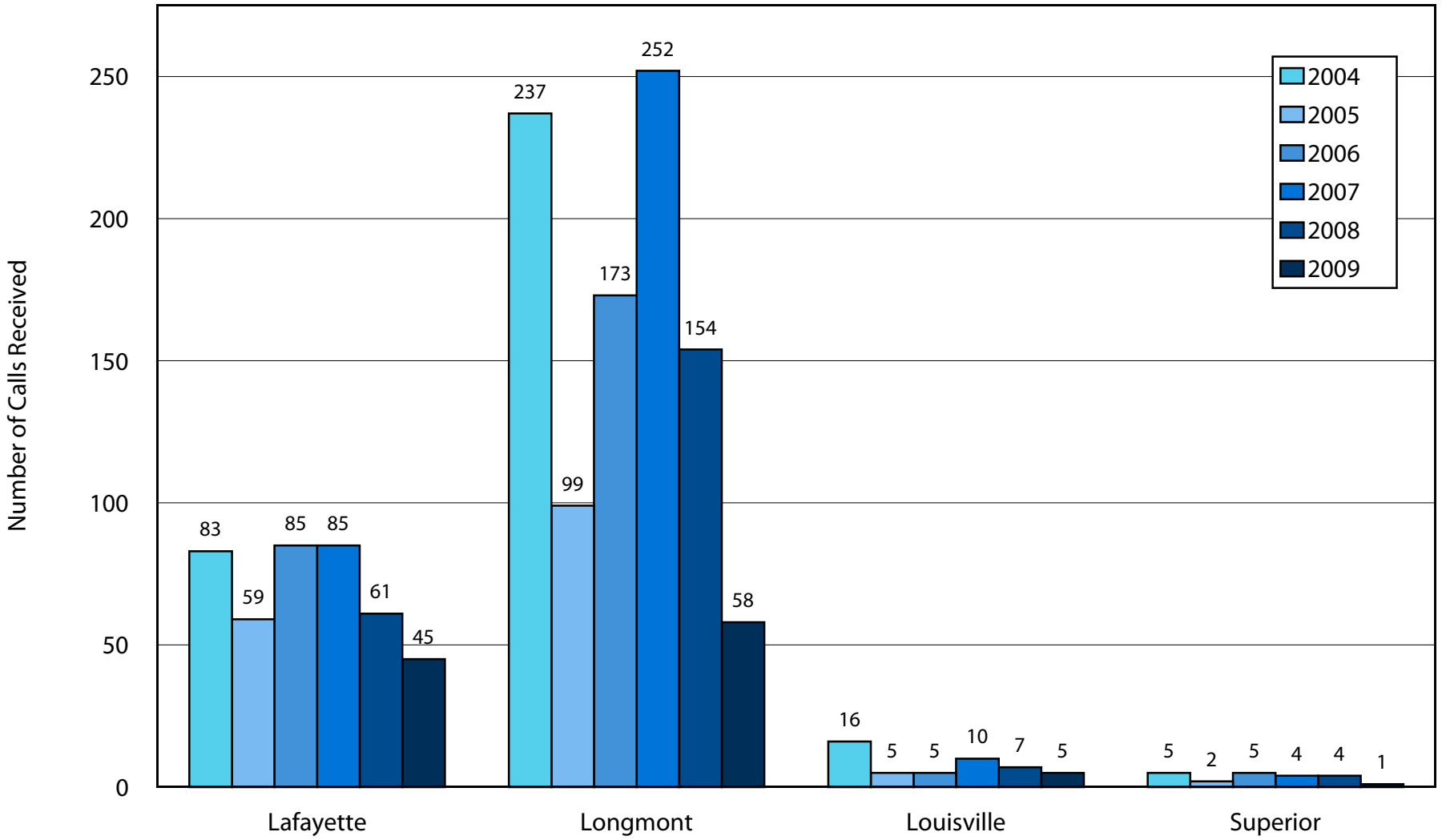
ULV Adulticide Comparison By Service Area

2003-2009 Boulder County Mosquito Control Programs



MosquitoLine Calls by Service Area

'05-'09 Boulder County Mosquito Control Programs



2009 Boulder County CDC Trap Composite Data

Total number of trap/nights set: 142

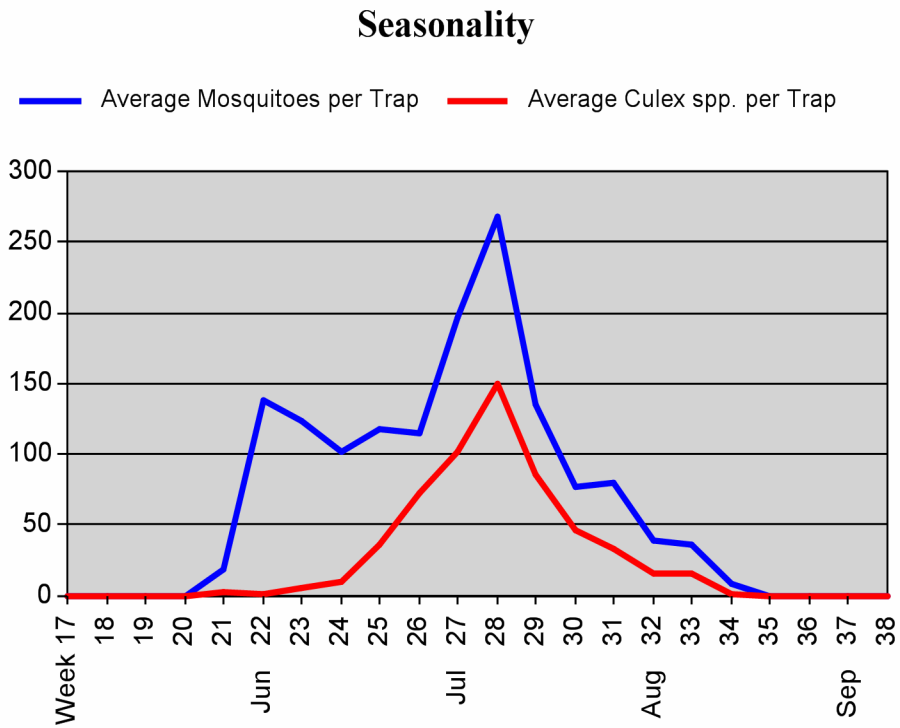
Total number of mosquitoes collected: 16,009

Average mosquitoes per trap/night: 113

Average Culex per trap/night: 47

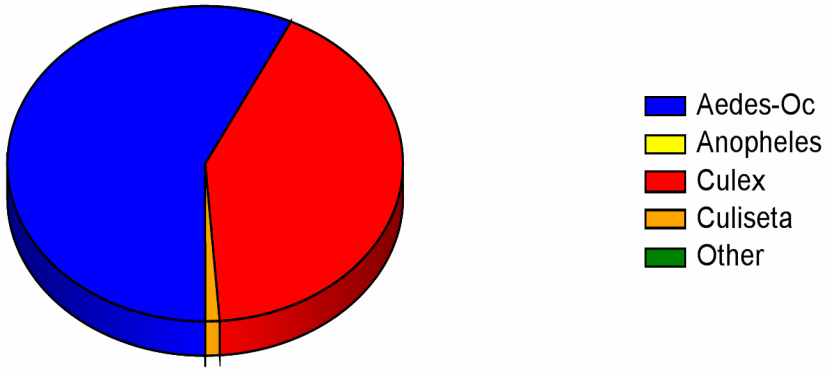
Species collected and abundance:

Aedes (Oc.) dorsalis	386	2.4 %
Aedes (Oc.) hendersoni	63	0.4 %
Aedes (Oc.) increpitus	257	1.6 %
Aedes (Oc.) melanimon	389	2.4 %
Aedes (Oc.) nigromaculis	12	0.1 %
Aedes (Oc.) trivitatus	348	2.2 %
Aedes vexans	7693	48.1 %
Culex pipiens	261	1.6 %
Culex salinarius	9	0.1 %
Culex tarsalis	6404	40.0 %
Culiseta inornata	186	1.2 %
Psorophora signipennis	1	0.0 %



Genus proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	9,148	57.1 %
Anopheles	0	0.0 %
Culex	6,674	41.7 %
Culiseta	186	1.2 %
Other	1	0.0 %



2009 Lafayette CDC Trap Composite Data

Total number of trap/nights set: 54

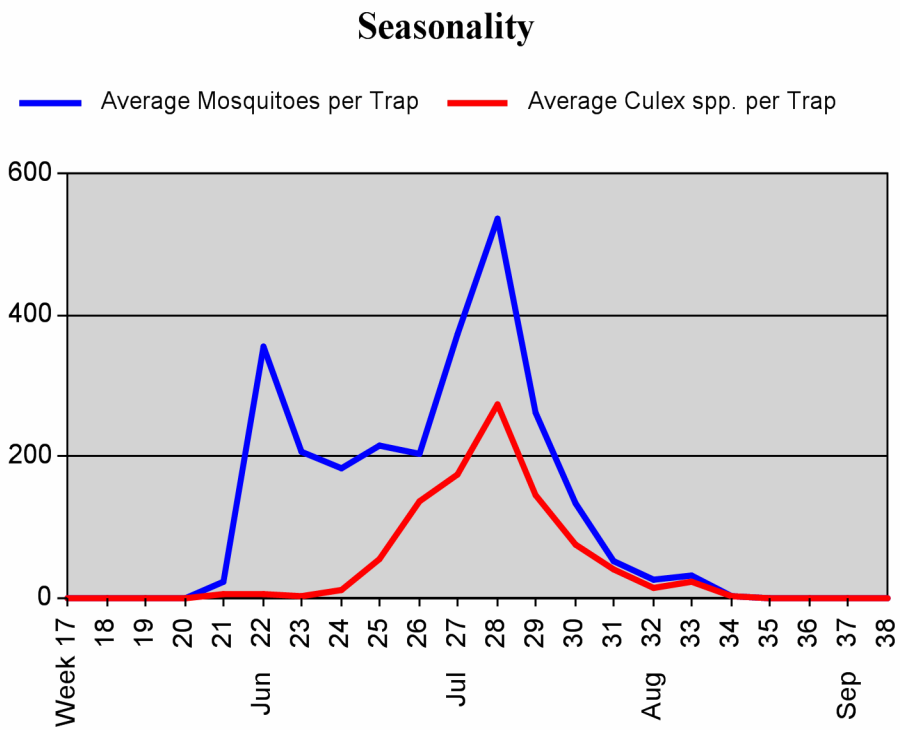
Total number of mosquitoes collected: 11,068

Average mosquitoes per trap/night: 205

Average Culex per trap/night: 80

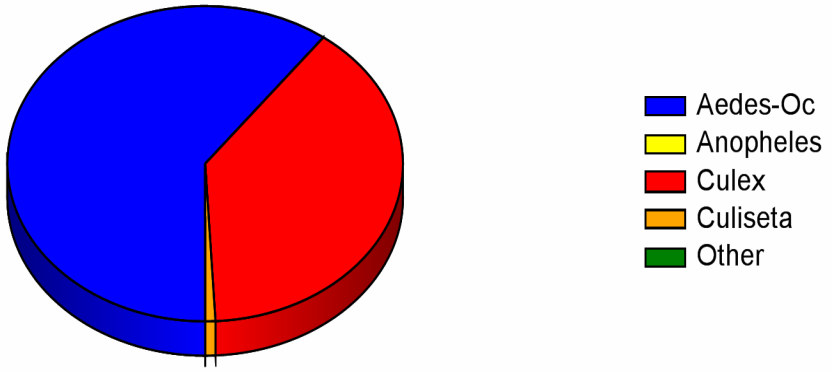
Species collected and abundance:

Aedes (Oc.) dorsalis	360	3.3 %
Aedes (Oc.) hendersoni	1	0.0 %
Aedes (Oc.) increpitus	27	0.2 %
Aedes (Oc.) melanimon	228	2.1 %
Aedes (Oc.) nigromaculis	10	0.1 %
Aedes (Oc.) trivitatus	161	1.5 %
Aedes vexans	5876	53.1 %
Culex pipiens	191	1.7 %
Culex salinarius	2	0.0 %
Culex tarsalis	4120	37.2 %
Culiseta inornata	91	0.8 %
Psorophora signipennis	1	0.0 %



Genus proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	6,663	60.2 %
Anopheles	0	0.0 %
Culex	4,313	39.0 %
Culiseta	91	0.8 %
Other	1	0.0 %

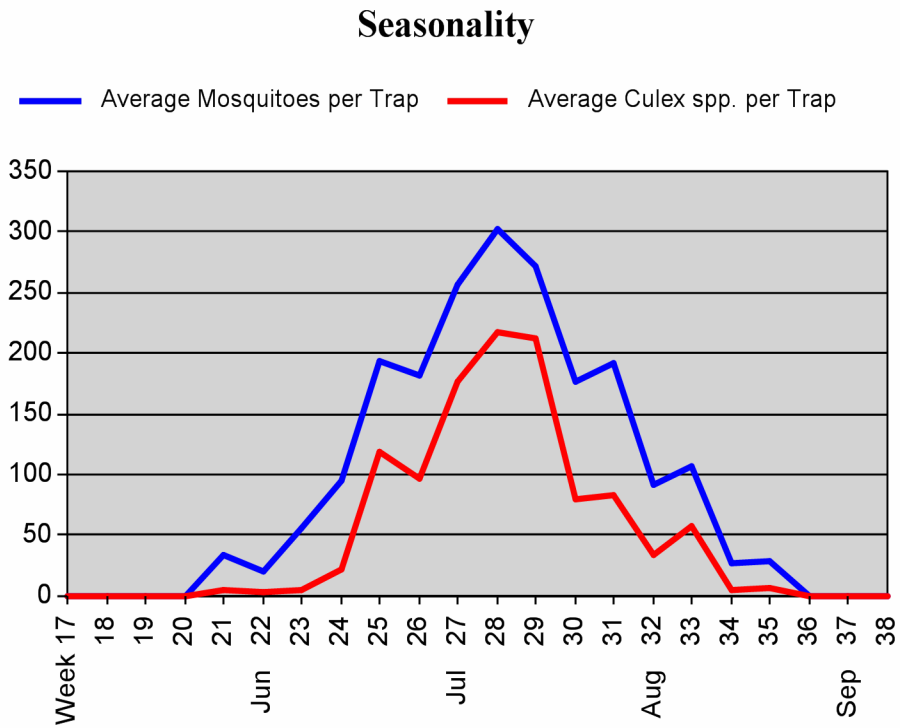


2009 Longmont CDC Trap Composite Data

Total number of trap/nights set: 187
Total number of mosquitoes collected: 28,162
Average mosquitoes per trap/night: 151
Average Culex per trap/night: 84

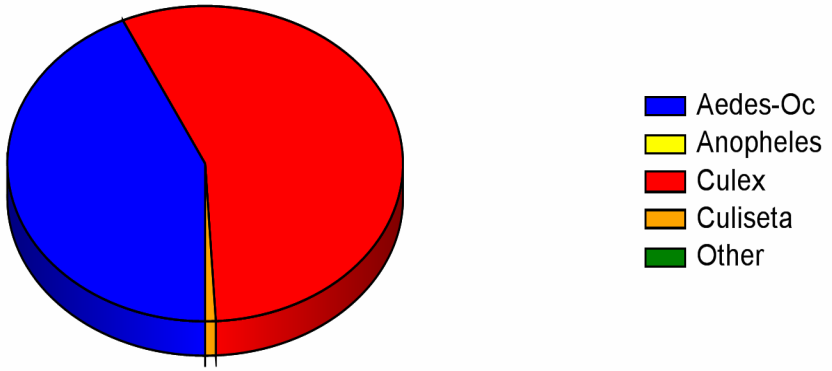
Species collected and abundance:

Aedes (Oc.) dorsalis	509	1.8 %
Aedes (Oc.) hendersoni	12	0.0 %
Aedes (Oc.) increpitus	899	3.2 %
Aedes (Oc.) melanimon	161	0.6 %
Aedes (Oc.) nigromaculis	25	0.1 %
Aedes (Oc.) trivitatus	519	1.8 %
Aedes vexans	10029	35.6 %
Coquillettidia perturbans	1	0.0 %
Culex erythrothorax	1	0.0 %
Culex pipiens	244	0.9 %
Culex salinarius	50	0.2 %
Culex tarsalis	15472	54.9 %
Culiseta inornata	240	0.9 %



Genus proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	12,158	43.2 %
Anopheles	0	0.0 %
Culex	15,767	56.0 %
Culiseta	240	0.9 %
Other	1	0.0 %



LM-02: Longmont Fox Hill GC

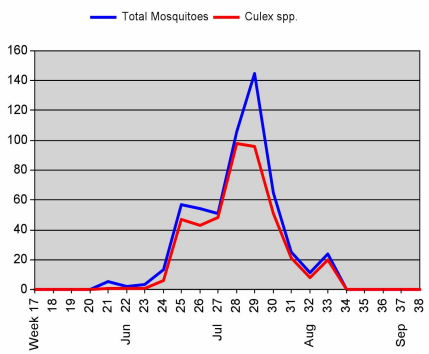
Season: 2009
Trap Type: Light/CO2
Location: SE side of pond on course east of Fox Hill Drive
GPS: N40° 10.320', W105° 4.245'

Total number of trap/nights set: 14
Total number of mosquitoes collected: 561
Average mosquitoes per trap/night: 40
Average Culex per trap/night: 32

Species collected and abundance:

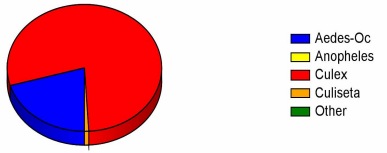
Aedes (Oc.) dorsalis	13	2.3 %
Aedes (Oc.) increpitus	1	0.2 %
Aedes (Oc.) melanimon	1	0.2 %
Aedes (Oc.) trivitatus	1	0.2 %
Aedes vexans	99	17.6 %
Culex pipiens	3	0.5 %
Culex tarsalis	438	78.1 %
Culiseta inornata	5	0.9 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	115	20.5 %
Anopheles	0	0.0 %
Culex	441	78.6 %
Culiseta	5	0.9 %
Other	0	0.0 %



LM-03: Jim Hamm Nature Area

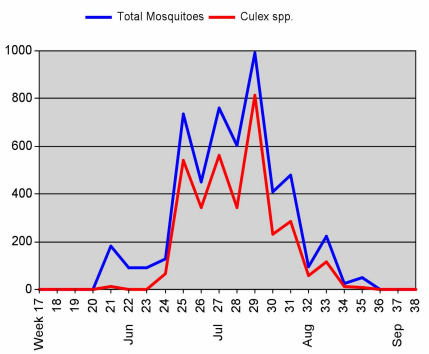
Season: 2009
Trap Type: Light/CO2
Location: Longmont 17th Ave. at Sundance Rd.
GPS: N40° 11.350', W105° 3.585'

Total number of trap/nights set: 20
Total number of mosquitoes collected: 8,312
Average mosquitoes per trap/night: 416
Average Culex per trap/night: 274

Species collected and abundance:

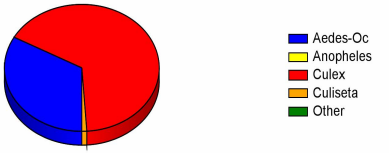
Aedes (Oc.) dorsalis	101	1.2 %
Aedes (Oc.) increpitus	4	0.0 %
Aedes (Oc.) melanimon	28	0.3 %
Aedes (Oc.) nigromaculis	1	0.0 %
Aedes (Oc.) trivitatus	54	0.6 %
Aedes vexans	2556	30.8 %
Culex pipiens	49	0.6 %
Culex salinarius	19	0.2 %
Culex tarsalis	5415	65.1 %
Culiseta inornata	85	1.0 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	2,746	33.0 %
Anopheles	0	0.0 %
Culex	5,483	66.0 %
Culiseta	85	1.0 %
Other	0	0.0 %



LM-06: Boulder Co Fairgrounds

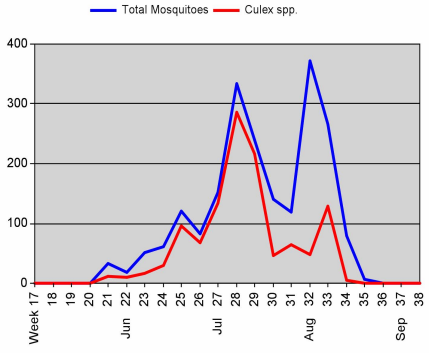
Season: 2009
Trap Type: Light/CO2
Location: on Boston Ave. east of Hover Rd. across from Abra
GPS: N40° 9.515', W105° 7.540'

Total number of trap/nights set: 21
Total number of mosquitoes collected: 2,966
Average mosquitoes per trap/night: 141
Average Culex per trap/night: 87

Species collected and abundance:

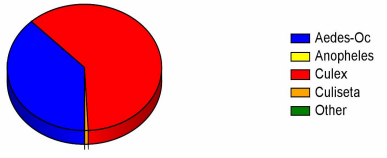
Aedes (Oc.) dorsalis	33	1.1 %
Aedes (Oc.) increpitus	27	0.9 %
Aedes (Oc.) melanimon	3	0.1 %
Aedes (Oc.) nigromaculis	1	0.0 %
Aedes (Oc.) trivitatus	172	5.8 %
Aedes vexans	890	30.0 %
Coquillettidia perturbans	1	0.0 %
Culex erythrothorax	1	0.0 %
Culex pipiens	60	2.0 %
Culex salinarius	13	0.4 %
Culex tarsalis	1743	58.8 %
Culiseta inornata	22	0.7 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	1,126	38.0 %
Anopheles	0	0.0 %
Culex	1,817	61.3 %
Culiseta	22	0.7 %
Other	1	0.0 %



LM-07: Schlagel

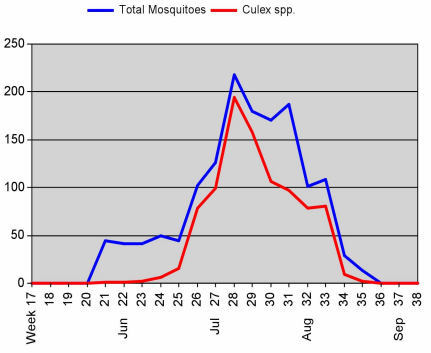
Season: 2009
Trap Type: Light/CO2
Location: 9421 Schlagel Street, Longmont
GPS: N40° 8.725', W105° 8.835'

Total number of trap/nights set: 21
Total number of mosquitoes collected: 2,164
Average mosquitoes per trap/night: 103
Average Culex per trap/night: 68

Species collected and abundance:

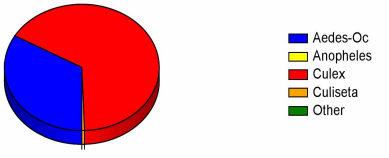
Aedes (Oc.) dorsalis	22	1.0 %
Aedes (Oc.) increpitus	131	6.1 %
Aedes (Oc.) melanimon	6	0.3 %
Aedes (Oc.) trivitatus	150	6.9 %
Aedes vexans	413	19.1 %
Culex pipiens	15	0.7 %
Culex salinarius	1	0.0 %
Culex tarsalis	1414	65.3 %
Culiseta inornata	12	0.6 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	722	33.4 %
Anopheles	0	0.0 %
Culex	1,430	66.1 %
Culiseta	12	0.6 %
Other	0	0.0 %



LM-08: 95th & Left Hand Creek

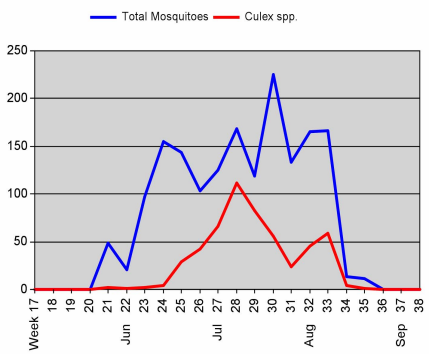
Season: 2009
Trap Type: Light/CO2
Location: off 95th St. south of intersection with Longmont D
GPS: N40° 8.040', W105° 7.920'

Total number of trap/nights set: 21
Total number of mosquitoes collected: 2,614
Average mosquitoes per trap/night: 124
Average Culex per trap/night: 40

Species collected and abundance:

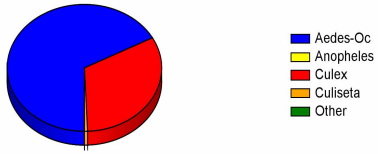
Aedes (Oc.) dorsalis	58	2.2 %
Aedes (Oc.) hendersoni	9	0.3 %
Aedes (Oc.) increpitus	15	0.6 %
Aedes (Oc.) melanimon	35	1.3 %
Aedes (Oc.) nigromaculis	1	0.0 %
Aedes (Oc.) trivitatus	51	2.0 %
Aedes vexans	1586	60.7 %
Culex pipiens	5	0.2 %
Culex tarsalis	837	32.0 %
Culiseta inornata	17	0.7 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	1,755	67.1 %
Anopheles	0	0.0 %
Culex	842	32.2 %
Culiseta	17	0.7 %
Other	0	0.0 %



LM-12: Ash Ct. So. of Purdue Dr.

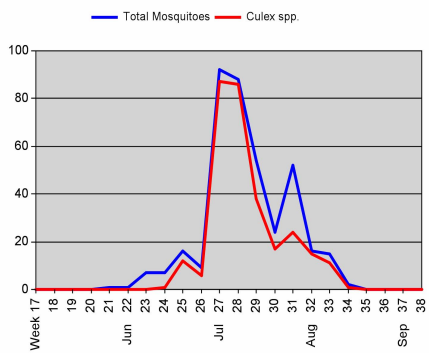
Season: 2009
Trap Type: Light/CO2
Location: on hill above pond south of Ash Ct. and Purdue Dr.
GPS: N40° 10.560', W105° 7.945'

Total number of trap/nights set: 14
Total number of mosquitoes collected: 383
Average mosquitoes per trap/night: 27
Average Culex per trap/night: 21

Species collected and abundance:

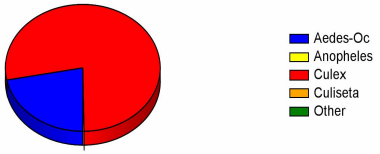
Aedes (Oc.) dorsalis	10	2.6 %
Aedes (Oc.) melanimon	3	0.8 %
Aedes (Oc.) nigromaculis	2	0.5 %
Aedes (Oc.) trivitatus	18	4.7 %
Aedes vexans	51	13.3 %
Culex pipiens	8	2.1 %
Culex tarsalis	290	75.7 %
Culiseta inornata	1	0.3 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	84	21.9 %
Anopheles	0	0.0 %
Culex	298	77.8 %
Culiseta	1	0.3 %
Other	0	0.0 %



LM-17: The Shores - Concord Way

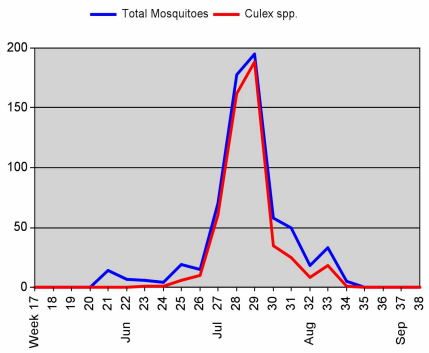
Season: 2009
Trap Type: Light/CO2
Location: between 3113 & 3117 Concord Way
GPS: N40° 11.970', W105° 8.775'

Total number of trap/nights set: 14
Total number of mosquitoes collected: 672
Average mosquitoes per trap/night: 48
Average Culex per trap/night: 37

Species collected and abundance:

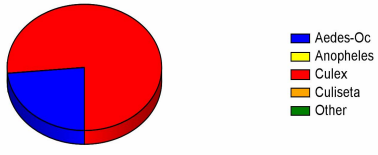
Aedes (Oc.) dorsalis	10	1.5 %
Aedes (Oc.) increpitus	3	0.4 %
Aedes (Oc.) melanimon	2	0.3 %
Aedes (Oc.) nigromaculis	1	0.1 %
Aedes (Oc.) trivitatus	27	4.0 %
Aedes vexans	115	17.1 %
Culex pipiens	2	0.3 %
Culex tarsalis	512	76.2 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	158	23.5 %
Anopheles	0	0.0 %
Culex	514	76.5 %
Culiseta	0	0.0 %
Other	0	0.0 %



LM-20: Longmont St. Vrain Greenway

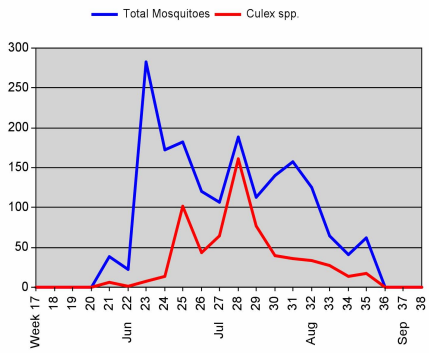
Season: 2009
Trap Type: Light/CO2
Location: east of confluence of St. Vrain & Left Hand Creeks
GPS: N40° 9.295', W105° 5.105'

Total number of trap/nights set: 21
Total number of mosquitoes collected: 2,726
Average mosquitoes per trap/night: 130
Average Culex per trap/night: 51

Species collected and abundance:

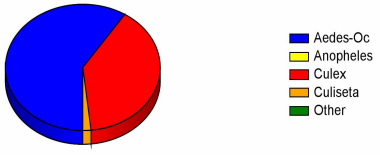
Aedes (Oc.) dorsalis	29	1.1 %
Aedes (Oc.) hendersoni	3	0.1 %
Aedes (Oc.) increpitus	665	24.4 %
Aedes (Oc.) melanimon	7	0.3 %
Aedes (Oc.) nigromaculis	2	0.1 %
Aedes (Oc.) trivitatus	20	0.7 %
Aedes vexans	886	32.5 %
Culex pipiens	57	2.1 %
Culex salinarius	16	0.6 %
Culex tarsalis	995	36.5 %
Culiseta inornata	46	1.7 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	1,612	59.1 %
Anopheles	0	0.0 %
Culex	1,068	39.2 %
Culiseta	46	1.7 %
Other	0	0.0 %



LM-22: Sandstone Ranch

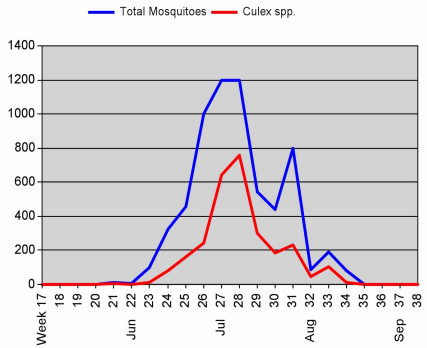
Season: 2009
Trap Type: Light/CO2
Location: Longmont at Sandstone Ranch District Park
GPS: N40° 9.205', W105° 2.430'

Total number of trap/nights set: 14
Total number of mosquitoes collected: 6,436
Average mosquitoes per trap/night: 460
Average Culex per trap/night: 199

Species collected and abundance:

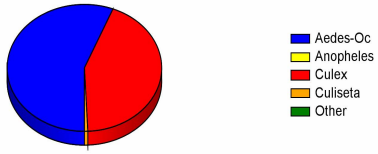
Aedes (Oc.) dorsalis	193	3.0 %
Aedes (Oc.) increpitus	53	0.8 %
Aedes (Oc.) melanimon	67	1.0 %
Aedes (Oc.) nigromaculis	4	0.1 %
Aedes (Oc.) trivitatus	23	0.4 %
Aedes vexans	3266	50.7 %
Culex pipiens	23	0.4 %
Culex salinarius	1	0.0 %
Culex tarsalis	2761	42.9 %
Culiseta inornata	45	0.7 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	3,606	56.0 %
Anopheles	0	0.0 %
Culex	2,785	43.3 %
Culiseta	45	0.7 %
Other	0	0.0 %



LM-23: Longmont Union Reservoir

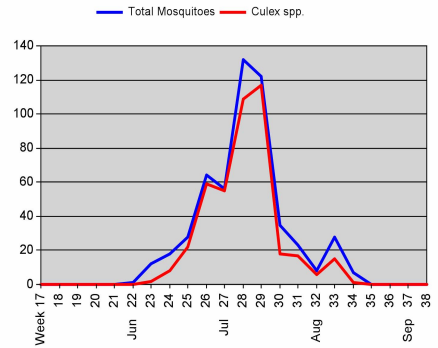
Season: 2009
Trap Type: Light/CO2
Location: on southern shore of Union Reservoir
GPS: N40° 10.345', W105° 2.730'

Total number of trap/nights set: 13
Total number of mosquitoes collected: 534
Average mosquitoes per trap/night: 41
Average Culex per trap/night: 33

Species collected and abundance:

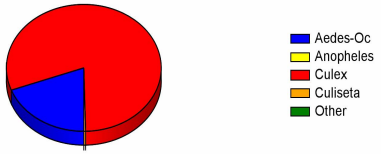
Aedes (Oc.) dorsalis	15	2.8 %
Aedes (Oc.) melanimon	2	0.4 %
Aedes vexans	86	16.1 %
Culex pipiens	3	0.6 %
Culex tarsalis	426	79.8 %
Culiseta inornata	2	0.4 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	103	19.3 %
Anopheles	0	0.0 %
Culex	429	80.3 %
Culiseta	2	0.4 %
Other	0	0.0 %



LM-24: Longmont Ute Creek Golf Course

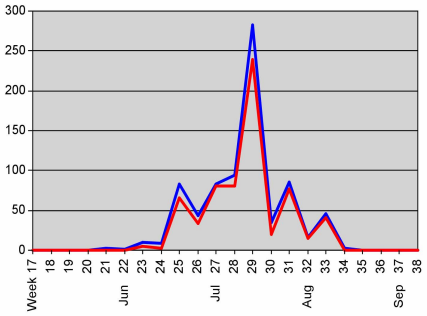
Season: 2009
Trap Type: Light/CO2
Location: off Alpine Street along western edge of golf course
GPS: N40° 11.580', W105° 5.010'

Total number of trap/nights set: 14
Total number of mosquitoes collected: 794
Average mosquitoes per trap/night: 57
Average Culex per trap/night: 47

Species collected and abundance:

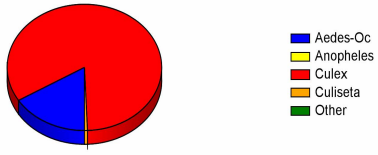
Aedes (Oc.) dorsalis	25	3.1 %
Aedes (Oc.) melanimon	7	0.9 %
Aedes (Oc.) nigromaculis	13	1.6 %
Aedes (Oc.) trivitatus	3	0.4 %
Aedes vexans	81	10.2 %
Culex pipiens	19	2.4 %
Culex tarsalis	641	80.7 %
Culiseta inornata	5	0.6 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	129	16.2 %
Anopheles	0	0.0 %
Culex	660	83.1 %
Culiseta	5	0.6 %
Other	0	0.0 %



2009 Louisville CDC Trap Composite Data

Total number of trap/nights set: 54

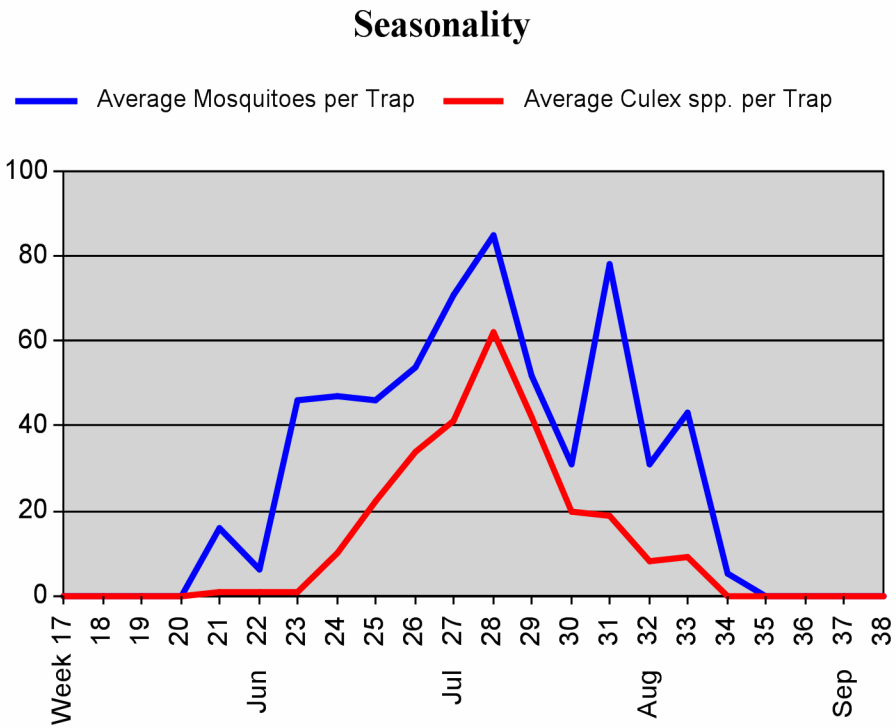
Total number of mosquitoes collected: 2,504

Average mosquitoes per trap/night: 46

Average Culex per trap/night: 22

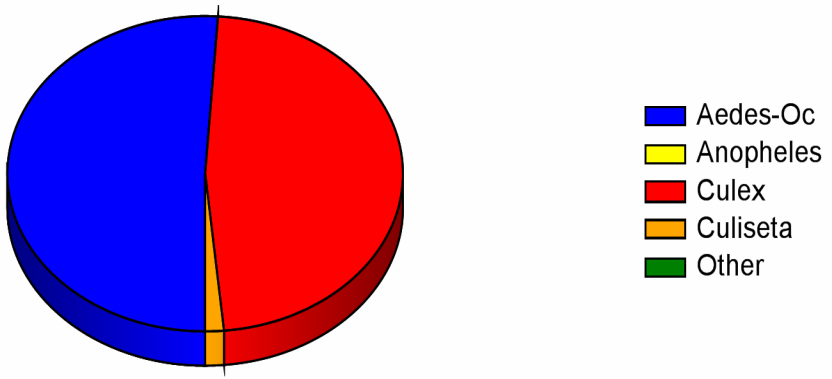
Species collected and abundance:

Aedes (Oc.) dorsalis	17	0.7 %
Aedes (Oc.) hendersoni	4	0.2 %
Aedes (Oc.) increpitus	20	0.8 %
Aedes (Oc.) melanimon	152	6.1 %
Aedes (Oc.) nigromaculis	1	0.0 %
Aedes (Oc.) trivitatus	42	1.7 %
Aedes vexans	1042	41.6 %
Culex pipiens	24	1.0 %
Culex tarsalis	1164	46.5 %
Culiseta inornata	38	1.5 %



Genus proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	1,278	51.0 %
Anopheles	0	0.0 %
Culex	1,188	47.4 %
Culiseta	38	1.5 %
Other	0	0.0 %



2009 Superior CDC Trap Composite Data

Total number of trap/nights set: 34

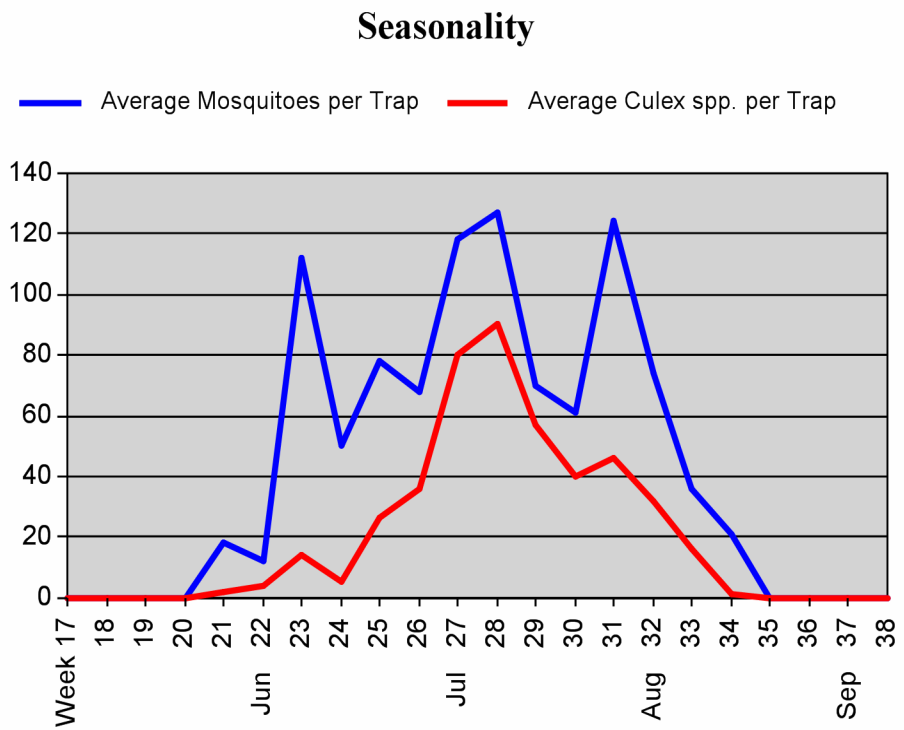
Total number of mosquitoes collected: 2,437

Average mosquitoes per trap/night: 72

Average Culex per trap/night: 34

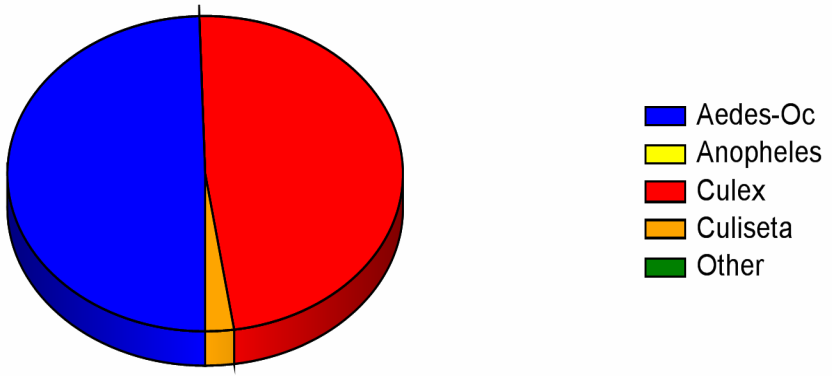
Species collected and abundance:

Aedes (Oc.) dorsalis	9	0.4 %
Aedes (Oc.) hendersoni	58	2.4 %
Aedes (Oc.) increpitus	210	8.6 %
Aedes (Oc.) melanimon	9	0.4 %
Aedes (Oc.) nigromaculis	1	0.0 %
Aedes (Oc.) trivitatus	145	5.9 %
Aedes vexans	775	31.8 %
Culex pipiens	46	1.9 %
Culex salinarius	7	0.3 %
Culex tarsalis	1120	46.0 %
Culiseta inornata	57	2.3 %



Genus proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	1,207	49.5 %
Anopheles	0	0.0 %
Culex	1,173	48.1 %
Culiseta	57	2.3 %
Other	0	0.0 %



LA-01: Waneka Lake Park

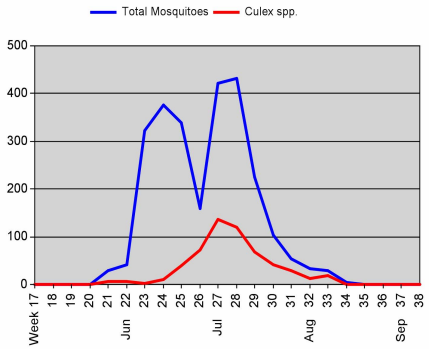
Season: 2009
Trap Type: Light/CO2
Location: north of Atlantis Avenue at Caria Drive
GPS: N39° 59.445', W105° 6.480'

Total number of trap/nights set: 20
Total number of mosquitoes collected: 4,391
Average mosquitoes per trap/night: 220
Average Culex per trap/night: 49

Species collected and abundance:

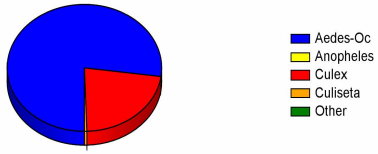
Aedes (Oc.) dorsalis	23	0.5 %
Aedes (Oc.) increpitus	13	0.3 %
Aedes (Oc.) melanimon	33	0.8 %
Aedes (Oc.) trivitatus	23	0.5 %
Aedes vexans	3297	75.1 %
Culex pipiens	49	1.1 %
Culex salinarius	2	0.0 %
Culex tarsalis	929	21.2 %
Culiseta inornata	22	0.5 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	3,389	77.2 %
Anopheles	0	0.0 %
Culex	980	22.3 %
Culiseta	22	0.5 %
Other	0	0.0 %



LA-05: Blue Heron

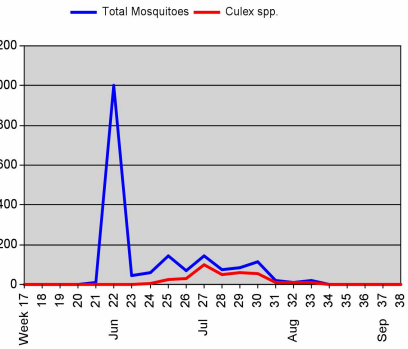
Season: 2009
Trap Type: Light/CO2
Location: south of Lake Meadow Drive near Heron Lake
GPS: N40° 1.315', W105° 7.490'

Total number of trap/nights set: 14
Total number of mosquitoes collected: 1,790
Average mosquitoes per trap/night: 128
Average Culex per trap/night: 26

Species collected and abundance:

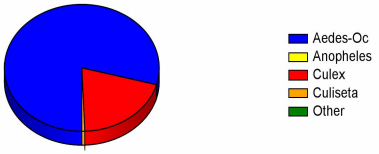
Aedes (Oc.) dorsalis	9	0.5 %
Aedes (Oc.) hendersoni	1	0.1 %
Aedes (Oc.) increpitus	4	0.2 %
Aedes (Oc.) melanimon	38	2.1 %
Aedes (Oc.) trivitatus	51	2.8 %
Aedes vexans	1316	73.5 %
Culex pipiens	8	0.4 %
Culex tarsalis	352	19.7 %
Culiseta inornata	11	0.6 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	1,419	79.3 %
Anopheles	0	0.0 %
Culex	360	20.1 %
Culiseta	11	0.6 %
Other	0	0.0 %



LA-06: Lafayette East - Dounce Street

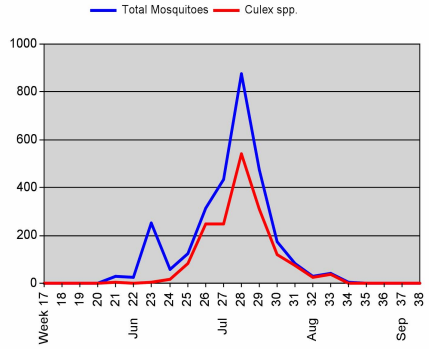
Season: 2009
Trap Type: Light/CO2
Location: north side of Dounce Street east of Brooks Ave.
GPS: N40° 0.075', W105° 4.880'

Total number of trap/nights set: 20
Total number of mosquitoes collected: 4,887
Average mosquitoes per trap/night: 244
Average Culex per trap/night: 149

Species collected and abundance:

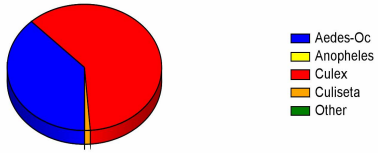
Aedes (Oc.) dorsalis	328	6.7 %
Aedes (Oc.) increpitus	10	0.2 %
Aedes (Oc.) melanimon	157	3.2 %
Aedes (Oc.) nigromaculis	10	0.2 %
Aedes (Oc.) trivitatus	87	1.8 %
Aedes vexans	1263	25.8 %
Culex pipiens	134	2.7 %
Culex tarsalis	2839	58.1 %
Culiseta inornata	58	1.2 %
Psorophora signipennis	1	0.0 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	1,855	38.0 %
Anopheles	0	0.0 %
Culex	2,973	60.8 %
Culiseta	58	1.2 %
Other	1	0.0 %



LO-01: Coal Creek G.C.

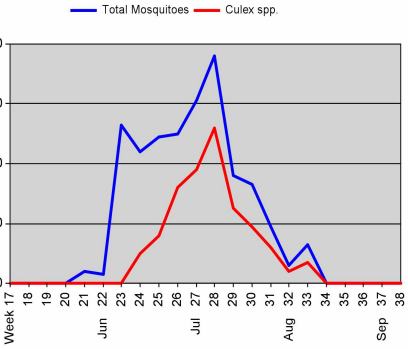
Season: 2009
Trap Type: Light/CO2
Location: Dillon Road at bridge over Coal Creek
GPS: N39° 57.470', W105° 9.115'

Total number of trap/nights set: 20
Total number of mosquitoes collected: 760
Average mosquitoes per trap/night: 38
Average Culex per trap/night: 19

Species collected and abundance:

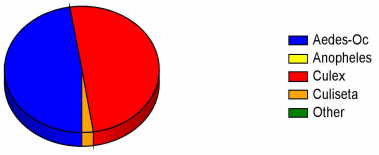
Aedes (Oc.) dorsalis	10	1.3 %
Aedes (Oc.) hendersoni	2	0.3 %
Aedes (Oc.) increpitus	11	1.4 %
Aedes (Oc.) melanimon	20	2.6 %
Aedes (Oc.) nigromaculis	1	0.1 %
Aedes (Oc.) trivitatus	6	0.8 %
Aedes vexans	311	40.9 %
Culex pipiens	5	0.7 %
Culex tarsalis	376	49.5 %
Culiseta inornata	18	2.4 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	361	47.5 %
Anopheles	0	0.0 %
Culex	381	50.1 %
Culiseta	18	2.4 %
Other	0	0.0 %



LO-04: Annette A. Brand Park

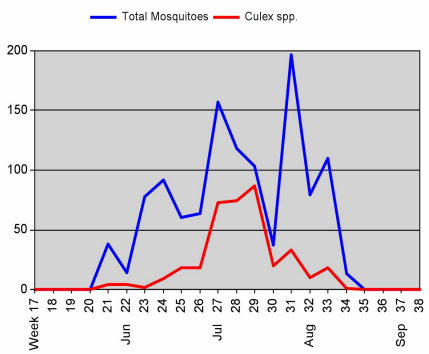
Season: 2009
Trap Type: Light/CO2
Location: Annette A. Brand Park at entrance to Louisville Re
GPS: N39° 59.415', W105° 9.495'

Total number of trap/nights set: 14
Total number of mosquitoes collected: 1,160
Average mosquitoes per trap/night: 83
Average Culex per trap/night: 26

Species collected and abundance:

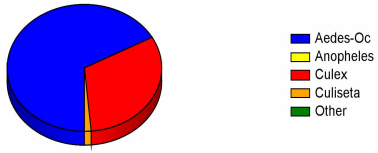
Aedes (Oc.) dorsalis	3	0.3 %
Aedes (Oc.) increpitus	9	0.8 %
Aedes (Oc.) melanimon	130	11.2 %
Aedes (Oc.) trivitatus	30	2.6 %
Aedes vexans	605	52.2 %
Culex pipiens	9	0.8 %
Culex tarsalis	358	30.9 %
Culiseta inornata	16	1.4 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	777	67.0 %
Anopheles	0	0.0 %
Culex	367	31.6 %
Culiseta	16	1.4 %
Other	0	0.0 %



LO-08: Coal Creek Trail

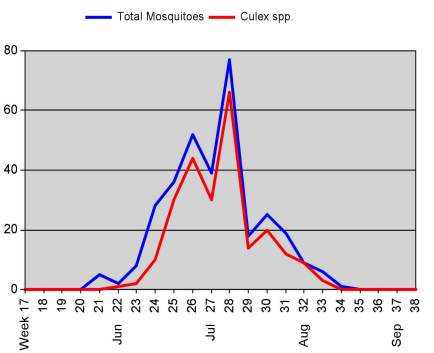
Season: 2009
Trap Type: Light/CO2
Location: Coal Creek Trailhead off Aspen Way
GPS: N39° 58.095', W105° 7.970'

Total number of trap/nights set: 20
Total number of mosquitoes collected: 584
Average mosquitoes per trap/night: 29
Average Culex per trap/night: 22

Species collected and abundance:

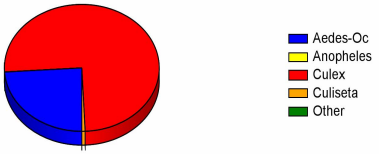
Aedes (Oc.) dorsalis	4	0.7 %
Aedes (Oc.) hendersoni	2	0.3 %
Aedes (Oc.) melanimon	2	0.3 %
Aedes (Oc.) trivitatus	6	1.0 %
Aedes vexans	126	21.6 %
Culex pipiens	10	1.7 %
Culex tarsalis	430	73.6 %
Culiseta inornata	4	0.7 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	140	24.0 %
Anopheles	0	0.0 %
Culex	440	75.3 %
Culiseta	4	0.7 %
Other	0	0.0 %



SU-01: Rock Creek

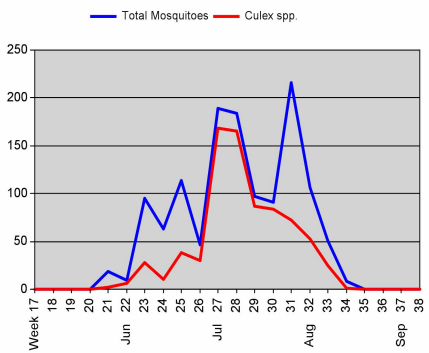
Season: 2009
Trap Type: Light/CO2
Location: northeast of Coalton Dr. and McCaslin Blvd.
GPS: N39° 55.780', W105° 9.785'

Total number of trap/nights set: 14
Total number of mosquitoes collected: 1,288
Average mosquitoes per trap/night: 92
Average Culex per trap/night: 55

Species collected and abundance:

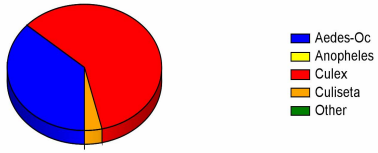
Aedes (Oc.) dorsalis	6	0.5 %
Aedes (Oc.) hendersoni	1	0.1 %
Aedes (Oc.) increpitus	24	1.9 %
Aedes (Oc.) nigromaculis	1	0.1 %
Aedes (Oc.) trivitatus	31	2.4 %
Aedes vexans	409	31.8 %
Culex pipiens	20	1.6 %
Culex salinarius	6	0.5 %
Culex tarsalis	743	57.7 %
Culiseta inornata	47	3.6 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	472	36.6 %
Anopheles	0	0.0 %
Culex	769	59.7 %
Culiseta	47	3.6 %
Other	0	0.0 %



SU-02: Superior Central

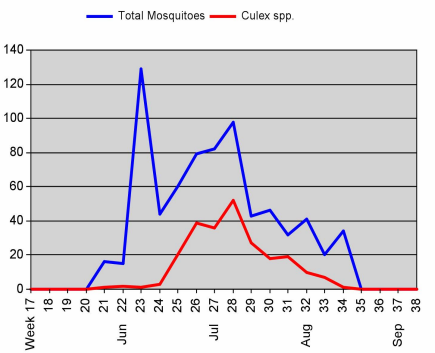
Season: 2009
Trap Type: Light/CO2
Location: along Coal Creek at 3rd Avenue and Charles Street
GPS: N39° 57.120', W105° 10.160'

Total number of trap/nights set: 20
Total number of mosquitoes collected: 1,149
Average mosquitoes per trap/night: 57
Average Culex per trap/night: 20

Species collected and abundance:

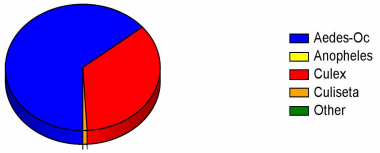
Aedes (Oc.) dorsalis	3	0.3 %
Aedes (Oc.) hendersoni	57	5.0 %
Aedes (Oc.) increpitus	186	16.2 %
Aedes (Oc.) melanimon	9	0.8 %
Aedes (Oc.) trivitatus	114	9.9 %
Aedes vexans	366	31.9 %
Culex pipiens	26	2.3 %
Culex salinarius	1	0.1 %
Culex tarsalis	377	32.8 %
Culiseta inornata	10	0.9 %

Seasonality



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	735	64.0 %
Anopheles	0	0.0 %
Culex	404	35.2 %
Culiseta	10	0.9 %
Other	0	0.0 %



Colorado Mosquito Control, Inc.

Adulticide Data

Customer	Subdiv/Area	Material	Start Time	End Time	Miles
Lafayette, City of					
Backpack Barrier					
06/11/2009	HERON LAKE	Talstar One	11:20:00	12:05:00	1.7
06/18/2009	DOUNCE	Talstar One	09:32:00	10:10:00	0.7
06/30/2009	HERON LAKE	Talstar One	12:33:00	13:20:00	2.0
07/15/2009	HERON LAKE	Talstar One	12:30:00	13:05:00	1.5
08/05/2009	HERON LAKE	Talstar One	11:25:00	12:03:00	1.5
		Backpack Barrier		**Sum**	**7.4**
				Avg	**1.5**
				Min	**0.7**
				Max	**2.0**
Truck ULV					
06/17/2009	WANEKA LAKE	AquaLuer ULV	20:48:00	20:55:00	1.0
06/24/2009	WANEKA LAKE	AquaLuer ULV	21:18:00	21:34:00	2.3
07/01/2009	WANEKA LAKE	AquaLuer ULV	20:19:00	20:25:00	0.9
07/01/2009	DOUNCE	AquaLuer ULV	20:32:00	20:39:00	1.4
07/08/2009	WANEKA LAKE	AquaLuer ULV	20:49:00	20:55:00	0.8
07/08/2009	DOUNCE	AquaLuer ULV	21:24:00	21:31:00	1.1
07/08/2009	CROSSRIDGE	AquaLuer ULV	21:06:00	21:14:00	2.1
07/15/2009	WANEKA LAKE	AquaLuer ULV	22:03:00	22:09:00	1.1
07/15/2009	OLD TOWN NORTH	AquaLuer ULV	22:14:00	22:21:00	1.1
07/22/2009	WANEKA LAKE	AquaLuer ULV	22:12:00	22:18:00	1.0
07/22/2009	SANDLER DRIVE	AquaLuer ULV	21:24:00	21:29:00	1.0
07/22/2009	OLD TOWN SOUTH	AquaLuer ULV	21:44:00	22:08:00	4.9
07/22/2009	OLD TOWN NORTH	AquaLuer ULV	21:32:00	21:39:00	1.1
08/05/2009	WANEKA LAKE	AquaLuer ULV	22:33:00	22:38:00	1.0
08/05/2009	OLD TOWN NORTH	AquaLuer ULV	21:43:00	21:59:00	2.8
08/05/2009	LAFAYETTE PARK	AquaLuer ULV	22:03:00	22:27:00	4.0
		Truck ULV		**Sum**	**27.6**
				Avg	**1.7**
				Min	**0.8**
				Max	**4.9**
Longmont, City of					
Truck ULV					
07/01/2009	JIM HAMM NATURE AREA	AquaLuer ULV	21:06:00	21:23:00	1.7
07/01/2009	BOULDER FAIRGROUNDS	AquaLuer ULV	20:25:00	20:47:00	3.0
07/08/2009	SANDSTONE RANCH	AquaLuer ULV	22:50:00	23:05:00	3.0
07/08/2009	JIM HAMM NATURE AREA	AquaLuer ULV	22:15:00	22:30:00	1.7
07/15/2009	ST VRAIN GREENWAY	AquaLuer ULV	23:12:00	23:21:00	0.7
07/15/2009	SANDSTONE RANCH	AquaLuer ULV	23:35:00	00:00:00	2.6
07/15/2009	JIM HAMM NATURE AREA	AquaLuer ULV	21:20:00	21:35:00	1.7
07/15/2009	WATERSONG/CREEKSIDE	AquaLuer ULV	22:05:00	22:54:00	7.7

Customer	Subdiv/Area	Material	Start Time	End Time	Miles
07/22/2009	UNION RESERVOIR	AquaLuer ULV	23:18:00	23:34:00	3.7
07/22/2009	THE SHORES	AquaLuer ULV	22:09:00	22:59:00	7.2
07/22/2009	ST VRAIN GREENWAY	AquaLuer ULV	23:41:00	23:46:00	0.7
07/22/2009	SANDSTONE RANCH	AquaLuer ULV	23:53:00	12:15:00	3.0
07/22/2009	JIM HAMN NATURE AREA	AquaLuer ULV	23:00:00	23:15:00	1.7
07/22/2009	FOX HILL GOLF COURSE	AquaLuer ULV	20:38:00	21:06:00	3.6
07/22/2009	WATERSONG CREEKSIDE	AquaLuer ULV	21:24:00	21:57:00	6.1
08/05/2009	WATERSONG CREEKSIDE	AquaLuer ULV	21:06:00	21:57:00	9.0
08/05/2009	ST VRAIN GREENWAY	AquaLuer ULV	22:43:00	23:06:00	2.0
08/05/2009	SANDSTONE RANCH	AquaLuer ULV	23:08:00	23:28:00	2.0
08/05/2009	JIM HAMM NATURE AREA	AquaLuer ULV	22:15:00	22:30:00	1.7
08/12/2009	ST VRAIN GREENWAY	AquaLuer ULV	22:20:00	22:31:00	1.6
08/12/2009	SANDSTONE RANCH	AquaLuer ULV	22:45:00	22:50:00	3.0
08/12/2009	JIM HAMM NATURE AREA	AquaLuer ULV	22:00:00	22:15:00	1.7
08/12/2009	WATERSONG CREEKSIDE	AquaLuer ULV	21:00:00	21:46:00	9.3
08/19/2009	WATERSONG CREEKSIDE	AquaLuer ULV	20:25:00	21:21:00	10.0
08/19/2009	ST VRAIN GREENWAY	AquaLuer ULV	21:59:00	22:11:00	2.0
08/19/2009	JIM HAMM NATURE AREA	AquaLuer ULV	21:36:00	21:51:00	1.7
08/26/2009	WATERSONG CREEKSIDE	AquaLuer ULV	20:55:00	21:31:00	7.0
08/26/2009	JIM HAMM NATURE AREA	AquaLuer ULV	21:48:00	22:03:00	1.7
		Truck ULV		**Sum**	**100.8**
				Avg	**3.6**
				Min	**0.7**
				Max	**10.0**
Louisville, City of					
Truck ULV					
07/15/2009	ANNETTE BRAND PARK	AquaLuer ULV	21:45:00	21:57:00	2.4
07/23/2009	COAL CREEK PATH	AquaLuer ULV	23:32:00	23:49:00	3.3
07/23/2009	COAL CREEK GOLF	AquaLuer ULV	22:24:00	23:24:00	11.7
07/23/2009	ANNETTE BRAND PARK	AquaLuer ULV	21:37:00	22:06:00	4.7
08/12/2009	ANNETTE BRAND PARK	AquaLuer ULV	20:29:00	20:44:00	2.4
		Truck ULV		**Sum**	**24.5**
				Avg	**4.9**
				Min	**2.4**
				Max	**11.7**
Superior, Town of					
Truck ULV					
06/16/2009	CENTRAL	AquaLuer ULV	22:38:00	22:58:00	4.0
06/16/2009	COMMUNITY PARK	AquaLuer ULV	23:09:00	23:19:00	1.1
07/01/2009	ROCK CREEK PARK PATH	AquaLuer ULV	21:02:00	21:10:00	1.1
07/02/2009	COAL CREEK GC		21:02:00	21:22:00	4.0
07/15/2009	ORIGINAL TOWN	AquaLuer ULV	20:58:00	21:15:00	3.5

Colorado Mosquito Control, Inc.

Adulticide Data

Customer	Subdiv/Area	Material	Start Time	End Time	Miles
07/15/2009	COMMUNITY PARK PATH	AquaLuer ULV	21:20:00	21:26:00	1.0
07/22/2009	ORIGINAL TOWN	AquaLuer ULV	20:35:00	20:51:00	3.5
07/22/2009	COMMUNITY PARK	AquaLuer ULV	20:55:00	21:03:00	1.1
08/12/2009	COMMUNITY PARK PATH	AquaLuer ULV	21:04:00	21:11:00	0.9
		Truck ULV		**Sum**	**20.2**
				Avg	**2.2**
				Min	**0.9**
				Max	**4.0**
				Grand Total	**180.5**

Colorado Mosquito Control, Inc.

Mosquito Line Call Summary

County	Customer Name		
Boulder			
	Boulder County-MCD		14
	Erie, Town of		2
	Lafayette, City of		45
	Longmont, City of		58
	Louisville, City of		5
	Superior, Town of		1
		Total Calls	125

COLORADO MOSQUITO CONTROL, INC.

Protecting Colorado From Annoyance & Disease Since 1986